

**MIDWAY**

**October 1993  
16-44029-101**

# **MORTAL KOMBAT II KIT**



## **OPERATIONS MANUAL**

**Installation & Operation • Testing & Problem Diagnosis  
Parts Information • Wiring Diagrams & Schematics**

# MORTAL KOMBAT II

## Instructions



*Insert Coin(s)*

*In a two player game, the loser pays and the winner stays.*

*Press the Punch and Kick buttons to attack an opponent.*

*Use the joystick to make the screen player jump or duck, and move left or right.*

*Use joystick and button combinations to discover secret moves.*

MIDWAY Manufacturing Company reserves the rights to make modifications and improvements to its products. The specifications and parts identified in this manual are subject to change without notice.

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# **MORTAL KOMBAT II KIT**

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## **S E C T I O N one**

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### **Operation & Installation**

## Safety Notices

The following safety hints apply to all kit operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page, and also all of Section 1, before preparing your kit for play.



### Notice: Salvaged Parts

Parts salvaged from old games are required to complete your kit. These salvaged parts must operate perfectly: otherwise, the converted game cannot perform properly or safely. Always repair circuit board malfunctions and cabinet damage before conversion is attempted.

### Notice: Power Supply

Be sure the power supply from your old game is capable of +5V dc at 5A, -5V dc at 1A and +12V at 2A. These operating voltages are necessary for your kit. Your power supply must be FCC approved.

### Notice: Monitor

This kit is not intended for use with X-Y monitors. Suitable monitors have horizontally mounted CRTs and raster electronics with inputs for red, green and blue video, as well as Composite Negative Sync inputs.

### Notice: Coin Mechanism

Be sure to clean and lubricate your old coin mechanisms. Servicing them is crucial to your game's earning potential and operation.

### Notice: Coin Meters

Coin meters are not provided with this kit. Wiring information is provided as a convenience to the operator.

### Notice: Servicing, Installing

Always turn your game Off and unplug it before attempting to service or install your kit.

## ATTENTION !

***PROPERLY ATTACH ALL CONNECTORS.*** Be sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your kit and void the warranty. All connectors are keyed to fit specific pins on each board.

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## CONVERSION PROCEDURES

### Inspection

Unpack the materials from the carton and inspect for obvious signs of damage. Use this checklist to be sure your kit is complete.

Part No.	Item	Quantity
<input type="checkbox"/> A-17266-40029	CPU Board	1
<input type="checkbox"/> A-17319-40029	DCS Sound board	1
<input type="checkbox"/> H-16561	STREET FIGHTER II Adapter Cable	1
<input type="checkbox"/> H-17354	Main JAMMA Cable	1
<input type="checkbox"/> H-17442-2	Sound Power Speaker Cable	1
<input type="checkbox"/> H-17455	Extra Function Cable	1
<input type="checkbox"/> H-17456	Y-T Adapter Cable	1
<input type="checkbox"/> 16-44029-101	Instruction Manual	1
<input type="checkbox"/> 16-9383	Controls Template	1
<input type="checkbox"/> 20-9687-1	Red Pushbutton	4
<input type="checkbox"/> 20-9687-2	White Pushbutton	4
<input type="checkbox"/> 20-9687-3	Blue Pushbutton	4
<input type="checkbox"/> 20-9694-1	Red 8-way Joystick	2
<input type="checkbox"/> 31-1789	Clear Control Panel Overlay	1
<input type="checkbox"/> 31-1829	Screened Overlay	1
<input type="checkbox"/> 31-1830-1	Screened Marquee	1
<input type="checkbox"/> 31-1832	Side Art Decal	2
<input type="checkbox"/> 31-1833	Decal Pad	1
<input type="checkbox"/> 5795-10937-18	20-pin Ribbon Cable	1
<input type="checkbox"/>	Assorted Hardware	

**Always Install PC Boards Exactly As Shown On Page 3-38.**

### Recommended Tools and Supplies

- ☐ black semi-gloss paint
- ☐ electric drill
- ☐ electric screwdriver
- ☐ grease pencil or marker
- ☐ hex driver
- ☐ 180 grit sandpaper or electric sander
- ☐ pliers
- ☐ razor knife
- ☐ soldering iron and solder
- ☐ wire cutters
- ☐ black electrical tape

# Converting from a STREET FIGHTER II game cabinet

## Cabinet Modifications

1. Remove the old decals and artwork and clean the glue residue. Repaint the cabinet with black semi-gloss paint. Allow paint to dry.
2. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, smooth it down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.
3. Check the kit for an FCC sticker and apply it over the existing sticker on the cabinet. See NOTICE to the left.
4. Apply the Game Play Instruction Decal to the CRT viewing glass. Be sure the decal does not obstruct the CRT.

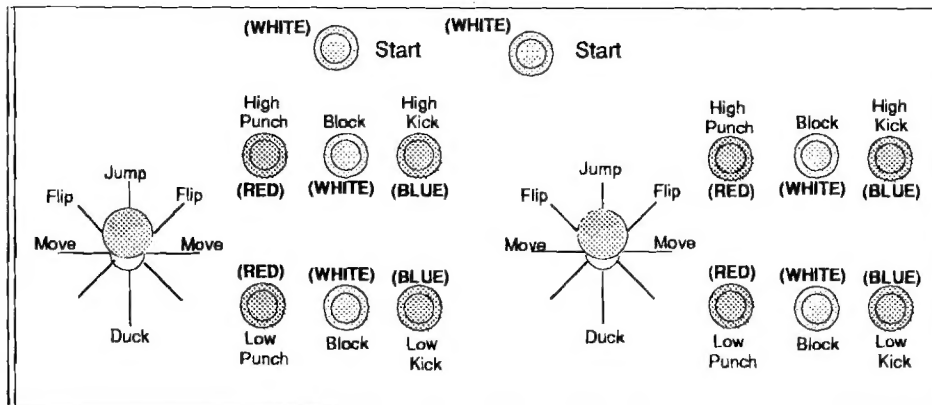
### **NOTICE**

**When Midway ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Midway Manufacturing immediately.**

## Control Panel Modifications

1. Remove the control panel buttons and joysticks and remove the old vinyl covering and artwork. Tagging the wires as they are removed from the pushbutton and joystick switches will make reinstallation easier.
2. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.
3. After the overlay is in place, use a razor knife to cut holes for the pushbuttons and joysticks. Position the stickers around the appropriate hole locations. See the page 1-5 for sticker locations.
4. Remove the switch from the pushbutton by pulling the large prong away from the switch, then pull the switch off the housing. Unscrew the nut from the housing. Push the switch housing through the control panel from the front. Screw the nut back onto the switch housing from the back of the control panel. Push the switch back into the switch housing.
5. Remove the "E"-ring and slide the shaft and the plastic ring off the joystick base. Be sure that the bushings remain in the base. Screw the base to the underside of the control panel. Slide the plastic ring around the shaft so that the rough side is next to the shaft handle. Slide the shaft through the control panel and base. Replace the "E"-ring.





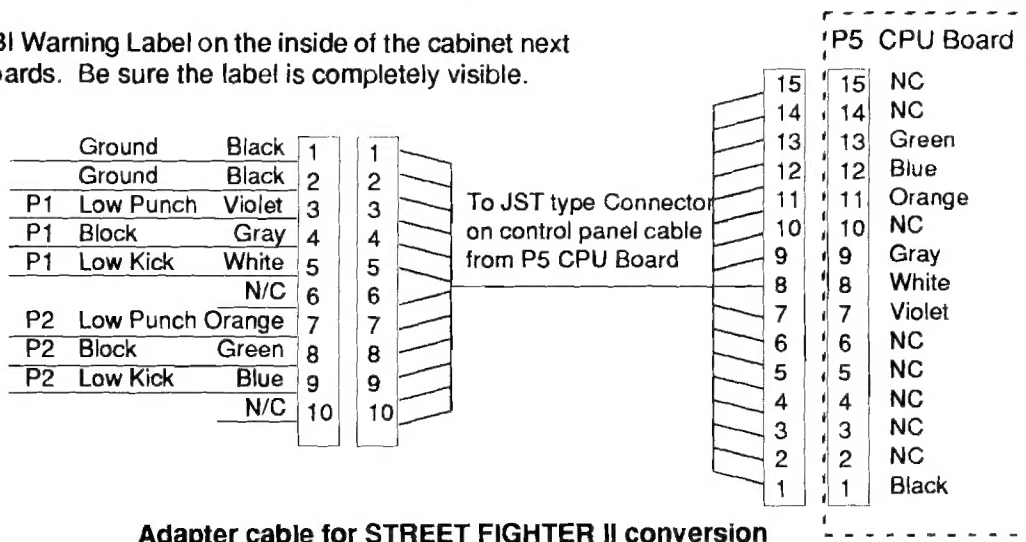
Typical control panel layout & sticker locations for modification of a STREET FIGHTER II control panel

## PC Board Installation

1. Replace the existing CPU board and sound board with the **Mortal Kombat II** CPU board and sound board.
2. Plug the JAMMA connector into the CPU board at P1. Plug the 10-pin connector of the Adapter cable into the 10-pin JST type connector from the control panel. Be sure to match the wire colors of both connectors. Plug the other end of the Adapter cable into the CPU board at P5.
3. Connect the ribbon cable from P4 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P1 on the sound board to P3 (sound power speaker connector) on the CPU board.
4. Only P1, P3, P4, P5, P12 and P14 through P17 are used on the CPU Board. All other connectors on the CPU are not used.
5. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

### Note

The ribbon cable may need to be twisted in order to connect it properly.



Adapter cable for STREET FIGHTER II conversion

# Converting from a typical video game cabinet

## Cabinet Modifications

1. Repaint the cabinet with black semi-gloss paint (games with wood grain sides: remove the old decals and artwork and clean the glue residue before painting). Allow paint to dry.
2. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, smooth it down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.
3. Check the kit for an FCC sticker and apply it over the existing sticker on the cabinet. See NOTICE to the left.
4. Apply the Game Play Instruction Decal to the CRT viewing glass. Be sure the decal does not obstruct the CRT.

### **NOTICE**

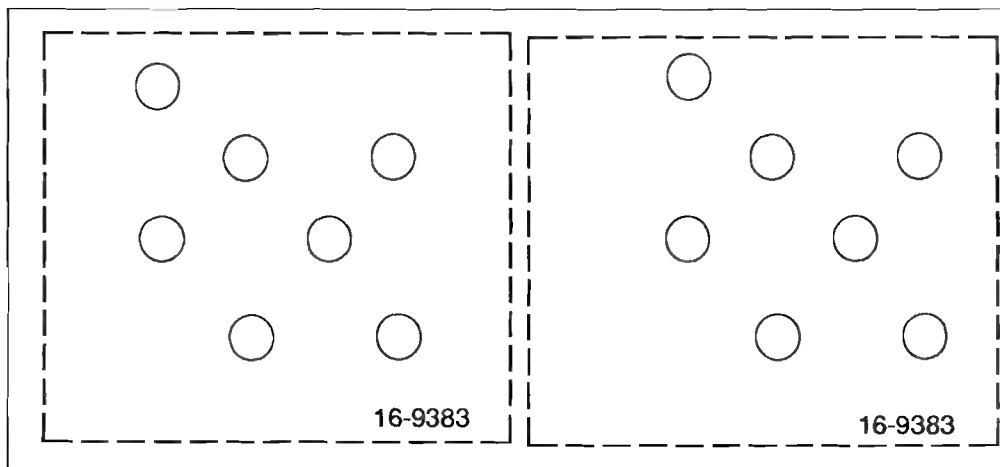
When Midway ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Midway Manufacturing immediately.

## Control Panel Modifications

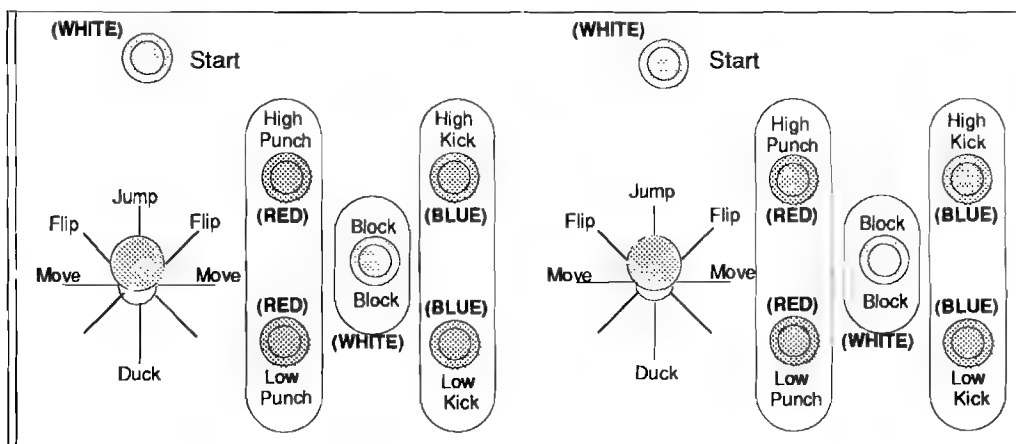
1. Remove the control panel buttons and joysticks and remove the old vinyl covering and artwork.
2. Use the control panel template to help you design your control panel. You will need to use the template twice. Once for the left player controls and once for the right player controls. Refer to page 1-7 for suggested template layouts.
3. Drill holes as needed for the joysticks and control panel buttons. Plug previous holes with wood blocks, putty, cardboard or epoxy. File the new holes smooth.
4. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.
5.
  - a) After the overlay is on securely, use a razor knife to cut holes for the control panel buttons and joysticks.
  - b) Position the stickers around the appropriate locations. Refer to page 1-7 for suggested control panel button and joystick sticker locations.
6. Remove the switch from the pushbutton by pulling the large prong away from the switch, then pull the switch off the housing. Unscrew the nut from the housing. Push the switch housing through the control panel from the front. Screw the nut back onto the switch housing from the back of the control panel. Push the switch back into the switch housing.

7. Remove the "E"-ring and slide the shaft and the plastic ring off the joystick base. Be sure that the bushings remain in the base. Screw the base to the underside of the control panel. Slide the plastic ring around the shaft so that the rough side is next to the shaft handle. Slide the shaft through the control panel and base. Replace the "E"-ring.

**Suggested control panel template layout**



**Suggested control panel layout and sticker locations for a typical video game control panel**



## Installing the PC boards and wiring into a JAMMA game cabinet

### **Note**

If you choose to use your own JAMMA Cable and not the one provided in the kit, be sure to check the JAMMA Cable Chart to verify that it is compatible.



### **CAUTION**

Properly insulate any unused wires within the JAMMA cable, especially the gray, gray-green and gray-yellow wires. This is a fully wired JAMMA cable. Many of the wires will not be used for this kit. These wires have been installed so that you can use this cable for future kits

### **Note**

The ribbon cable may need to be twisted in order to connect it properly.

1. Disconnect and remove the existing CPU board and sound board in the JAMMA game cabinet.
2. Mount the CPU board inside the JAMMA game cabinet where the old CPU board was located. Mount the sound board next to the CPU board using the stand-offs and screws provided.
3. If you choose to use the JAMMA cable provided with the kit, disconnect your old JAMMA cable from the speaker, power supply, control panel switches (may already be disconnected) and coin door. Remove the cable from the game. If you are not going to use the JAMMA Cable provided with the kit, check the JAMMA Cable Chart to be sure your cable is compatible. Leave your power supply chassis as is.
4. Connect the JAMMA cable to P1 on the CPU board. Use the Cabinet Wiring Diagram for reference and solder the correct JAMMA cable wires to the speaker. Then, connect the wires to the coin door, power supply and control panel.  
  
Player 1 has white-color stripe wires except for Start 1 which has a solid white wire. Player 2 has violet-color stripe wires. Follow the Control Panel Wire Color List on the inside of the back cover, or the Cabinet Wiring Diagram in Section 3 of this book.
5. Connect the Auxiliary cable to P5 of the CPU board. Follow the Cabinet Wiring Diagram or the Control Panel Wire Color List and connect the wires to the switches for the Low Punch and Low Kick buttons for players 1 & 2.
6. Connect the ribbon cable from P4 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P1 on the sound board to P3 (sound power speaker connector) on the CPU board.
7. Only P1, P3, P4, P5, P12 and P14 through P17 are used on the CPU Board. All other connectors on the CPU are not used.
8. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

## Installing the PC boards and wiring into a NON-JAMMA game cabinet

1. Disconnect and remove the existing CPU board and sound board in the game cabinet.
2. Mount the CPU board inside the game cabinet where the old CPU board was removed. Mount the sound board next to the CPU board using the stand-offs and screws provided.
3. Leaving several inches of wire, cut the wires at the coin door, control panel switches (which may already be disconnected) speaker and power supply. Remove the existing harness from the cabinet. Leave the cable hooks in place.
4. Install the JAMMA cable provided in this kit. Players 1 & 2, the coin door and the power supply wires are bundled together in individual groups. Insure that the cable is properly dressed and supported.
5. Connect the JAMMA cable to P1 on the CPU board. Use the Cabinet Wiring Diagram for reference and solder the correct JAMMA cable wires to the speaker. Then, connect the wires to the coin door, power supply and control panel.

Player 1 has white-color stripe wires except for Start 1 which has a solid white wire. Player 2 has violet-color stripe wires. Follow the Control Panel Wire Color List on the inside of the back cover, or the Cabinet Wiring Diagram in Section 3 of this book.

6. Connect the Auxiliary cable to P5 of the CPU board. Follow the Cabinet Wiring Diagram or the Control Panel Wire Color List and connect the wires to the switches for the Low Punch and Low Kick buttons for players 1 & 2.
7. Connect the ribbon cable from P4 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P1 on the sound board to P3 (sound power speaker connector) on the CPU board.
8. Only P1, P3, P4, P5, P12 and P14 through P17 are used on the CPU Board. All other connectors on the CPU are not used.
9. Place the FBI Warning Label on the inside of the cabinet next to the PC board\$. Be sure the label is completely visible.

### **Note**

Be sure all spliced wires are well insulated with black electrical tape.

### **CAUTION**

Properly insulate any unused wires within the JAMMA cable, especially the gray, gray-green and gray-yellow wires. This is a fully wired JAMMA cable. Many of the wires will not be used for this kit. These wires have been installed so that you can use this cable for future kits

### **Note**

The ribbon cable may need to be twisted in order to connect it properly.

## Game Features

### **Note**

When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

### **STARTING UP**

Switch on power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows **MORTAL KOMBAT II** REVISION LEVEL, CMOS TEST OK and the COIN SETTING. The game then begins the Attract Mode.

Insert the desired amount of coins, bills or tokens. Press the appropriate Start button. Use the joysticks to select an on-screen player. Use a control panel button to lock in the selection. The game starts automatically.

### **Player Controls**

#### **Start Buttons**

Each player has a Start button which allows him/her to begin or continue play.

#### **High Kick/High Punch Buttons**

Allows the on-screen player to kick or punch an opponent in the upper body.

#### **Low Kick/Low Punch Buttons**

Allows the on-screen player to kick or punch an opponent in the lower body.

#### **Block Buttons**

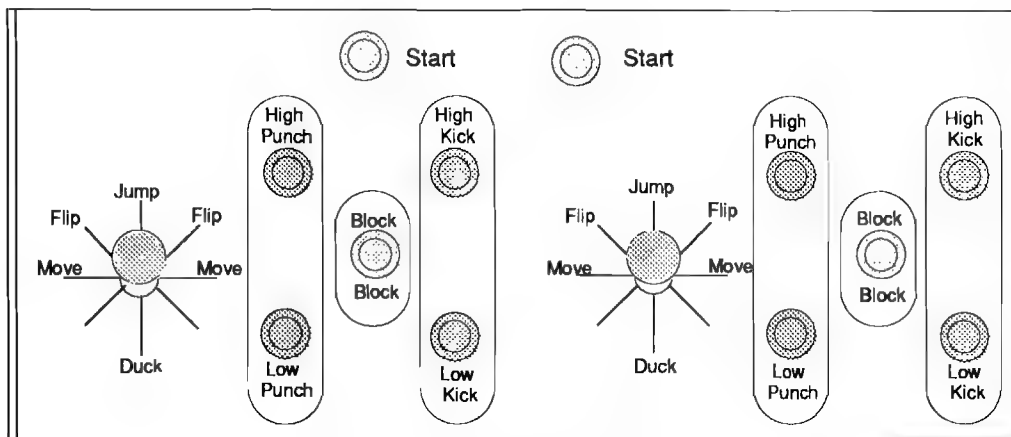
Allows the on-screen player to block an opponent's punch, kick or special move.

#### **Joystick**

Allows the on-screen player to move, flip, jump and duck.

### **Note**

Discover secret moves by using joystick and button combinations.



**Control Panel**

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## Menu System Operation

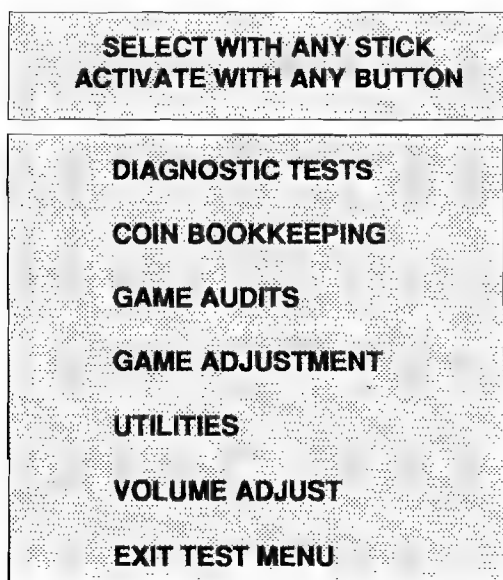
### OPERATION

All **MORTAL KOMBAT II** Game Audits, Adjustments, and Diagnostics are options of the Main Menu. Each option in turn, has its own menu, listing several choices that you may act upon as desired.

Close Switch #8 of DIP Switch Bank #2 to activate the Main Menu (shown below). Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Press any button to activate a highlighted option.

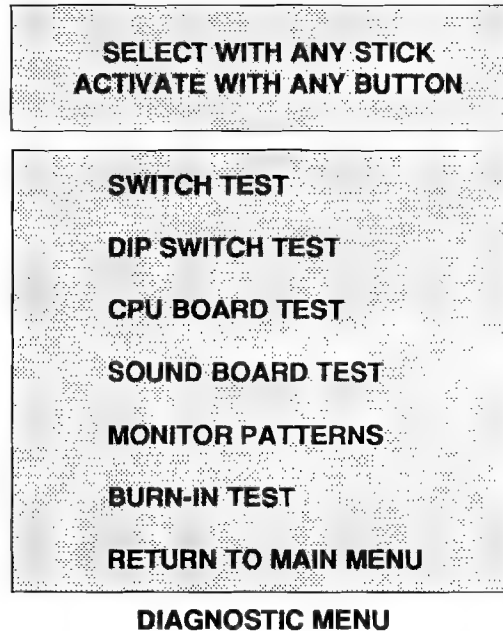
**Note:** Only highlighted options can be activated.



**MAIN MENU**

## **DIAGNOSTIC TESTS**

To enter the Diagnostic Tests from the Main Menu, move any joystick to select (highlight) the Diagnostic Test option and press any control panel button to activate the option.



### **Switch Test**

The Switch Test allows the operator to test the switches on the control panel and the coin door (if wired).

Select the Switch Test by using any joystick to highlight the Switch Test option, then press any control panel button to activate the option.

During the Switch Test, the top of the screen shows the locations of the control panel switches. The bottom of the screen shows the locations of the coin door switches. Press a control panel switch and the switch location, on the top of the screen, lights. Press a coin door switch and the switch location, on the bottom of the screen, lights. Release the switch and the screen returns to normal.

Press the Start buttons together to return to the Diagnostic Menu.



## DIP Switch Test

The DIP Switch Test allows the operator to check the position of the two DIP Switches on the CPU Board. The operator can also change the setting of each position of each DIP Switch during this mode.

Use any joystick to select the DIP Switch Test and any control panel button to activate it. The screen displays their current settings.

To change a DIP Switch setting, press the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press any control panel button to return to the Diagnostic Menu.

### DIP Switch 1 Settings Table

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
<b>Violence On</b>	Off * On							
<b>Blood in game</b>	Off * On							
<b>Low Blow in game</b>	Off * On							
<b>Attract Sounds On</b>	Off * On							
<b>Comic Offer On</b>	Off * On							
<b>Dollar Bill Validator</b> Not Installed Installed	Off * On							
<b>Not Used</b>	Off * On	Off * On						

### DIP Switch 2 Settings Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
<b>Coinage</b> DIP Switch CMOS	Off * On							
<b>Coin Settings</b>	Off * On	Off * On	Off * On	Off * On				
USA 1 Ger 1 Fr 1	Off	Off	Off	Off				
USA 2 Ger 2 Fr 2	Off	Off	Off	Off				
USA 3 Ger 3 Fr 3	Off	Off	Off	Off				
USA 4 Ger 4 Fr 4	Off	Off	Off	Off				
USA ECA Ger ECA Fr ECA	Off	Off	Off	Off				
N/U N/U N/U	Off	Off	Off	Off				
N/U N/U N/U	Off	Off	Off	Off				
Free Play Free Play Free Play	Off	Off	Off	Off				
<b>Country</b> USA German French Not Used	Off * On Off On	Off * On Off On						
<b>One Counter</b> <b>Two Counters</b>	Off * On							
<b>Test Switch</b> Game Mode Test Mode	Off * On							

\* Indicates Factory Setting

## **CPU Board Test**

The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Select the CPU Board Test with any joystick, then press any control panel button to activate the automatic test of the CPU Board's RAMs and ROMs.

When this test is activated a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs and ROMs. A ROM or RAM location that is shown as black with a white outline is used and should turn either red or green. A ROM or RAM location that is shown as gray with a white outline is not used in this game. During the test ROMs or RAMs are good if they turn green and they are faulty if they turn red.

The CPU Test pauses when a bad ROM or RAM is detected. Press any button to continue the test.

## **Sound Board Test**

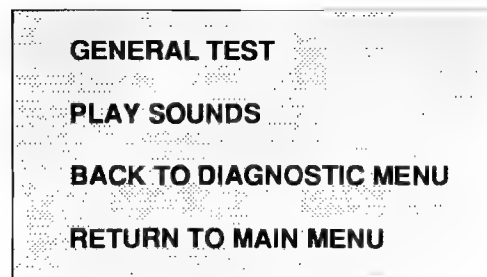
This test allows listening to some of the sounds that this game is capable of producing.

Select the Sound Board Test with any joystick, then press any control panel button to activate it. The screen displays two test options.

**GENERAL TEST** analyzes the sound circuitry. The screen shows a list of error codes. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones or no tone at all to sound.

**PLAY SOUNDS** tests synthesized & digitized sounds from the Sound Board. Advance to the next sound by pressing any action button. Press either Start button to repeat a sound.

Select **RETURN TO MAIN MENU** or **BACK TO DIAGNOSTIC MENU**. Press any control panel button to activate your selection.

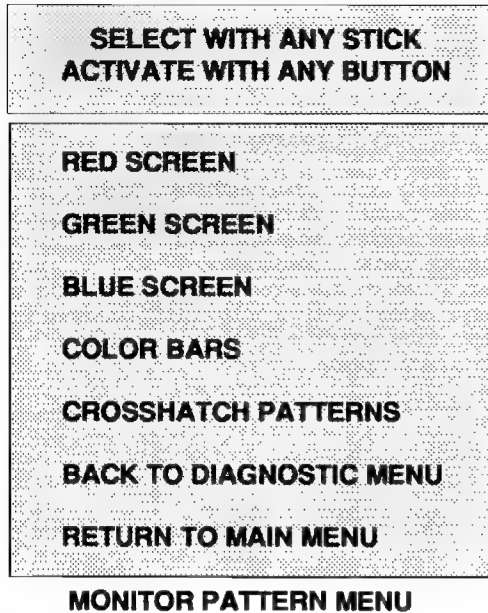


**SOUND TEST MENU**

## Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor.

Select the test with any joystick and activate with any control panel button. Once in the Monitor Patterns Test, move any joystick to select a test option and press any control panel button to activate it. Press any control panel button again to return to the Monitor Patterns Test menu.



The **RED**, **GREEN** and **BLUE SCREEN** tests fill the screen with either red, green or blue.

The **COLOR BARS** test fills the screen with several shades of colors to help with red, green and blue level adjustments. Each color should appear sharp and clear.

The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should appear round.

If any of the Monitor Pattern Tests shows a need for adjustment use the proper white knobs on the Monitor Board.

Use any joystick to select **RETURN TO MAIN MENU** or **BACK TO DIAGNOSTIC MENU** and activate with any control panel button.

## Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Move any joystick to select the Burn-in Test, then press any control panel button to activate the test. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. The second page of the Audit Table specifies the number of Burn-in cycles successfully completed. Use this test to find intermittent CPU problems.

To exit this test switch the game Off then On again.

## COIN BOOKKEEPING

To enter the Coin Bookkeeping from the Main Menu, move any joystick to select the Coin Bookkeeping option, then press any control panel button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item and the right side shows the number of coins, credits, or plays for each item.

To exit Coin Bookkeeping, move any joystick to select RETURN TO MAIN MENU, then press any control panel button to activate it.

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
SERVICE CREDITS	0
PAID CREDITS	0
TOTAL PLAYS	0
PLAYS UNTIL HIGH SCORE RESET	5000
MORE DETAILED DATA RETURN TO MAIN MENU	

COIN BOOKKEEPING TABLE

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
TOTAL COLLECTIONS	0
CLEAR COIN METERS RETURN TO MAIN MENU	

TOTAL COLLECTION TABLE

## GAME AUDITS

To enter Game Audits from the Main Menu, move any joystick to select the Game Audits option, then press any control panel button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page" or "Previous Audit Page", then press any control panel button to change the page.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item the right side shows the amount of play.

HOURS GAME WAS ON	0
HOURS PLAYED WITH 1 PLAYER	0
HOURS PLAYED WITH 2 PLAYERS	0
TOTAL PLAYS	0
1 PLAYER CONTINUES TAKEN	0
2 PLAYER CONTINUES TAKEN	0
BURN-IN LOOPS SUCCESSFULLY COMPLETED	0
NEXT AUDIT PAGE RETURN TO MAIN MENU	

PAGE 1 OF AUDIT TABLE

KUNG LAO CHOSEN	0
LIU KANG CHOSEN	0
CAGE CHOSEN	0
BARAKA CHOSEN	0
KITATA CHOSEN	0
MILEENA CHOSEN	0
SHANG TSUNG CHOSEN	0
RAIDEN CHOSEN	0
SUB-ZERO CHOSEN	0
REPTILE CHOSEN	0
SCORPION CHOSEN	0
JAX CHOSEN	0
PREVIOUS AUDIT PAGE RETURN TO MAIN MENU	

PAGE 2 OF AUDIT TABLE

To exit the Game Audit Table, move any joystick to select RETURN TO MAIN MENU, then press any control panel button to activate your selection.

## GAME ADJUSTMENTS

Move any joystick to select the Game Adjustment option on the Main Menu, then press any control panel button to activate it.

The Game Adjustments Menu allows the owner/operator to change the Game Pricing and Game Difficulty.

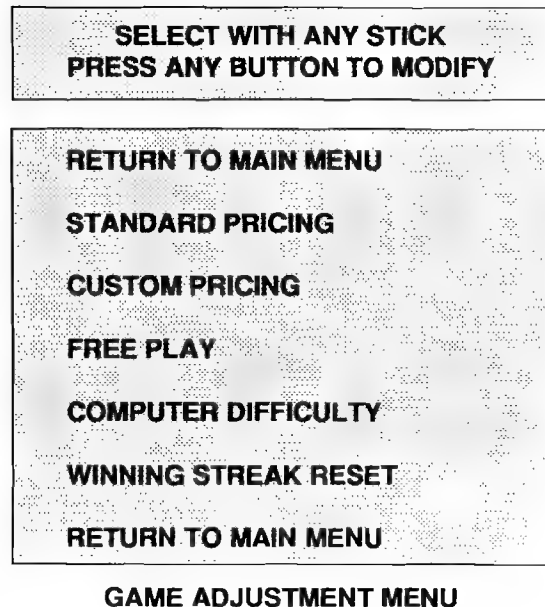
The Game Adjustments Menu offers several options. Each option has several choices. Move any joystick to select an option, then press any control panel button to activate that option. The next menu screen provides a setting choice. Move any joystick to modify the setting value, then press any control panel button to lock in the new value and return to the Adjustment Menu. Move the joystick up to increase the setting value, move the joystick down decrease the setting value.

To exit the Adjustments Menu, use any joystick to select RETURN TO MAIN MENU, then use any control panel button to activate your selection.

### **Note**

Game Adjustments are explained in more detail on the following page.

Adjustment values set by DIP Switch, override adjustment values set by the menu system.



## **Game Adjustments**

### **Standard Pricing**

Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table. See page 1-20.

Modify the setting value with any joystick. Press any control panel button to lock in the new value and return to the Adjustment Menu.

### **Custom Pricing**

Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the maximum amount of credits per game, the amount of credits required to start a game, and the amount or credits required to continue a game. This option is being adjusted from the Dip Switch Settings. See page 1-21.

Modify the setting value with any joystick. Press any control panel button to lock in a new value and return to the Adjustment Menu.

### **Free Play**

This option selects free play. The setting choices for this adjustment are:

- No (factory)
- Yes

### **Computer Difficulty**

This option determines the difficulty level of game play. The setting choices for this adjustment are:

- 1 (Extra Easy)
- 2 (Easy)
- 3 (Medium; factory)
- 4 (Hard)
- 5 (Extra Hard)

### **Winning Streak Reset**

This option resets the highest scores after a selected amount of games are played. The setting choices for this adjustment are:

- Reset every 5,000 games.
- Reset every 10, 000 games (factory).
- Reset every 15, 000 games.
- Do Not Reset.

## Standard Pricing Table

Name	Settings Credit/Coin	Left Chute	Center Chute	Right Chute	Fourth Chute
USA 1	1/25¢ (2 to Start; 2 to Continue)	25¢	\$1.00	25¢	
USA 2	1/25¢ (2 to Start; 1 to Continue)	25¢	\$1.00	25¢	
USA 3	1/25¢ (1 to Start; 1 to Continue)	25¢	\$1.00	25¢	
USA 4	1/50¢, 3/\$1.00 (1 to Start; 1 to Continue)	25¢	\$1.00	25¢	
USA 5	1/50¢, 4/\$1.00 (2 to Start; 1 to Continue)	25¢	\$1.00	25¢	
USA 6	1/50¢ (1 to Start; 1 to Continue)	25¢	\$1.00	25¢	
USA 7	1/50¢, 3/\$1.00 (1 to Start; 1 to Continue)	25¢	\$1.00	25¢	
USA 8	1/50¢, 4/\$1.00 (2 to Start; 2 to Continue)	25¢	\$1.00	25¢	
USA ECA	1/25¢, 4/\$1.00 (2 to Start; 2 to Continue)	\$1.00	10¢	25¢	5¢
German 1	1/1DM, 6/5DM	1DM		5DM	
German 2	1/1DM, 7/5DM	1DM		5DM	
German 3	1/1DM, 8/5DM	1DM		5DM	
German 4	1/1DM, 5/5DM	1DM		5DM	
German 5	1/1DM, 6/5DM	1DM		5DM	
German ECA	1/1DM, 2/2DM, 6/5DM	5DM	1DM	2DM	
France 1	2/5F, 5/10F	5F		10F	
France 2	2/5F, 4/10F	5F		10F	
France 3	1/5F, 3/10F	5F		10F	
France 4	1/5F, 2/10F	5F		10F	
France 5	2/5F, 5/10F, 11/2 x 10F	5F		10F	
France 6	2/5F, 4/10F, 9/2 x 10F	5F		10F	
France 7	1/5F, 3/10F, 7/2 x 10F	5F		10F	
France 8	1/5F, 2/10F, 5/2 x 10F	5F		10F	
France 9	1/3 x 1F, 2/5F	1F		5F	
France 10	1/2 x 1F, 3/5F	1F		5F	
France 11	1/3 x 1F, 2/5F, 5/2 x 5F	1F		5F	
France 12	1/2 x 1F, 3/5F, 7/2 x 5F	1F		5F	
France ECA	1/3 X 1F, 2/5F, 5/2 X 5F	1F	10F	5F	
Canada	1/2 x 25¢, 3/\$1.00	25¢		\$1.00	
Swiss 1	1/1F, 6/5F	1F		5F	
Swiss 2	1/1F, 7/5F	1F		5F	
Swiss 3	1/1F, 8/5F	1F		5F	
Italy	1/500 lire	500 lire		500 lire	
UK 1	1/20P, 3/50P	20P		50P	
UK 2	2/20P, 5/50P	20P		50P	
UK ECA	1/20P, 3/50 P, 7/£1.00	£1.00	20P	50P	10P
UK Elec w/CCU	1/30P, 2/50P, 4/£1.00	£1.00		CCU	
Spain 1	1/100 peseta, 6/500 peseta	100 peseta		500 peseta	
Spain 2	1/100 peseta, 5/500 peseta	100 peseta		500 peseta	
Australia 1	1/3 x 20¢, 2/\$1.00	20¢		\$1.00	
Australia 2	1/5 x 20¢, 1/\$1.00	20¢		\$1.00	
Japan 1	1/100 yen	100 yen		100 yen	
Japan 2	2/100 yen	100 yen		100 yen	
Austria 1	1/5 schilling, 2/10 schilling	5 schilling		10 schilling	
Austria 2	1/2 x 5 schilling, 3/2 x 10 schilling	5 schilling		10 schilling	
Belgium 1	1/20F	20F		20F	
Belgium 2	3/20F	20F		20F	
Belgium 3	2/20F	20F		20F	
Belgium ECA	1/20F	50F	5F	20F	
Sweden	1/3 x 1 krona, 2/5 krona	1 krona		5 krona	
New Zealand 1	1/3 x 20¢	20¢		20¢	
New Zealand 2	1/2 x 20¢	20¢		20¢	
Netherlands	1/1HFI, 3/2.5HFI	1HFI		2.5HFI	
Finland	1/1 markka	1 markka		1 markka	
Norway	1/2 x 1 krone, 3/5 x 1 krone	1 krone		1 krone	
Denmark	1/2 x 1 krone, 3/5 krone, 7/2 x 5 krone	1 krone		5 krone	
Antillies	1/25¢, 4/1 guilder	25¢		1 guilder	
Hungary	1/2 x 10 forint, 3/2 x 20 forint	10 forint		20 forint	

If option desired is not shown above, use Custom pricing.



## Custom Pricing

**SELECT WITH ANY STICK  
PRESS ANY BUTTON TO MODIFY**

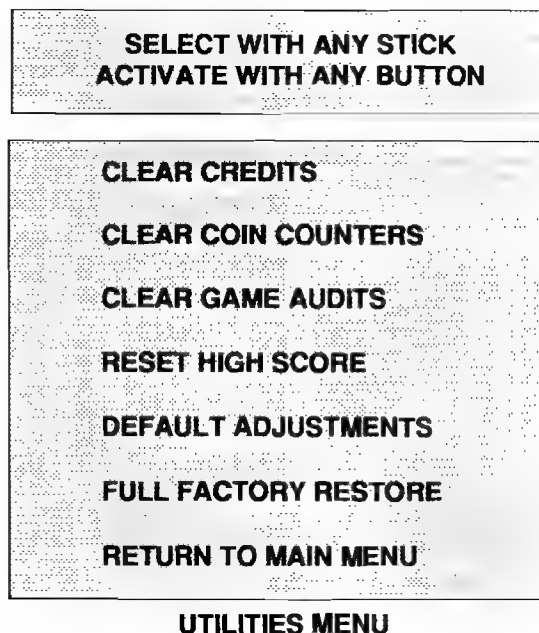
**RETURN TO ADJ. MENU**  
**(1) LEFT CHUTE UNITS**  
**(1) RIGHT CHUTE UNITS**  
**(1) THIRD CHUTE UNITS**  
**(1) FOURTH CHUTE UNITS**  
**(2) UNITS/CREDITS**  
**(3) UNITS/BONUS**  
**(4) MINIMUM UNITS REQUIRED**  
**(5) CREDITS TO START**  
**(6) CREDITS TO CONTINUE**  
**(7) COINS PER DOLLAR**  
**MAXIMUM CREDITS**  
**RETURN TO ADJ. MENU**

- (1) Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in the fourth chute (see "units/credit").
- (2) This is the number of coin units required to buy one credit.
- (3) One bonus credit is awarded after this many coin units have accumulated.
- (4) No credits will be awarded until this many coin units have accumulated.
- (5) Each player needs this many credits to begin a game.
- (6) Each player needs this many credits to continue a game.
- (7) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals.)
- (8) This is the limit for the credits counter. Additional coins inserted will be lost (factory setting: 30).

## UTILITIES

Move any joystick to select the Utilities option on the Main Menu, then press any control panel button to activate it.

The Utilities Menu allows the owner/operator to clear the game's bookkeeping memory and to install a custom message.



Move any joystick to select an item from the Utilities Menu, then press any control panel button to activate that item. After an item has been activated, you are given the option of resetting it or not.

For example:



Move any joystick to choose YES or NO, then press any control panel button to lock in your choice and to return to the Utilities Menu.

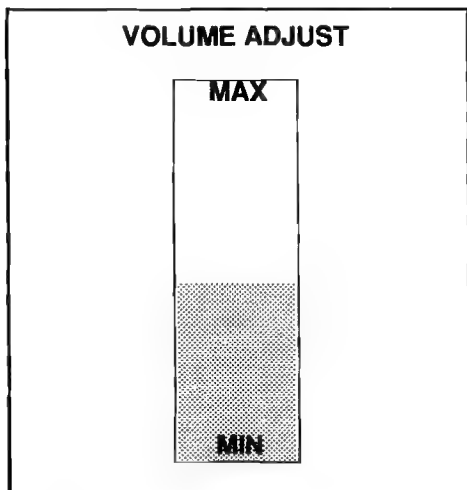
To exit the Utilities Menu, move any joystick to select RETURN TO MAIN MENU, then press any control panel button to activate your selection.

## VOLUME ADJUST

Move any joystick to select the Volume Adjust option on the Main Menu, then press any control panel button to activate it.

The Volume Adjust allows the operator to control the audio level of the game.

Use any joystick, or the volume buttons, to adjust the volume to the desired level. The scale on the screen shows the volume level.



Press any button to return to the Main Menu.

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## Troubleshooting

Problem	Possible Solution
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON AND NOTHING HAPPENS.	Check line fuse. Check for +5Vdc at pins C, D, 3, and 4 of the JAMMA Connector.
NO SOUND.	Check the speaker and speaker connection to pins L and 10 on the JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to the Sound Board.
MOVE JOYSTICK AND THE SCREEN PLAYER DOES NOT MOVE.	Check for open wires between the joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.
PRESS START BUTTON AND NOTHING HAPPENS.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
PRESS ANY CONTROL PANEL BUTTON AND SCREEN PLAYER DOES NOT MOVE.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED.	Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA Connector or Coin Switch 2 and pin T of the JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED.	Check Game Pricing setting. Check for a short between pins T & 16 on the JAMMA Connector.
GAME STAYS IN TEST MODE.	Check that switch #8 of DIP Switch Bank #2 is set to off.

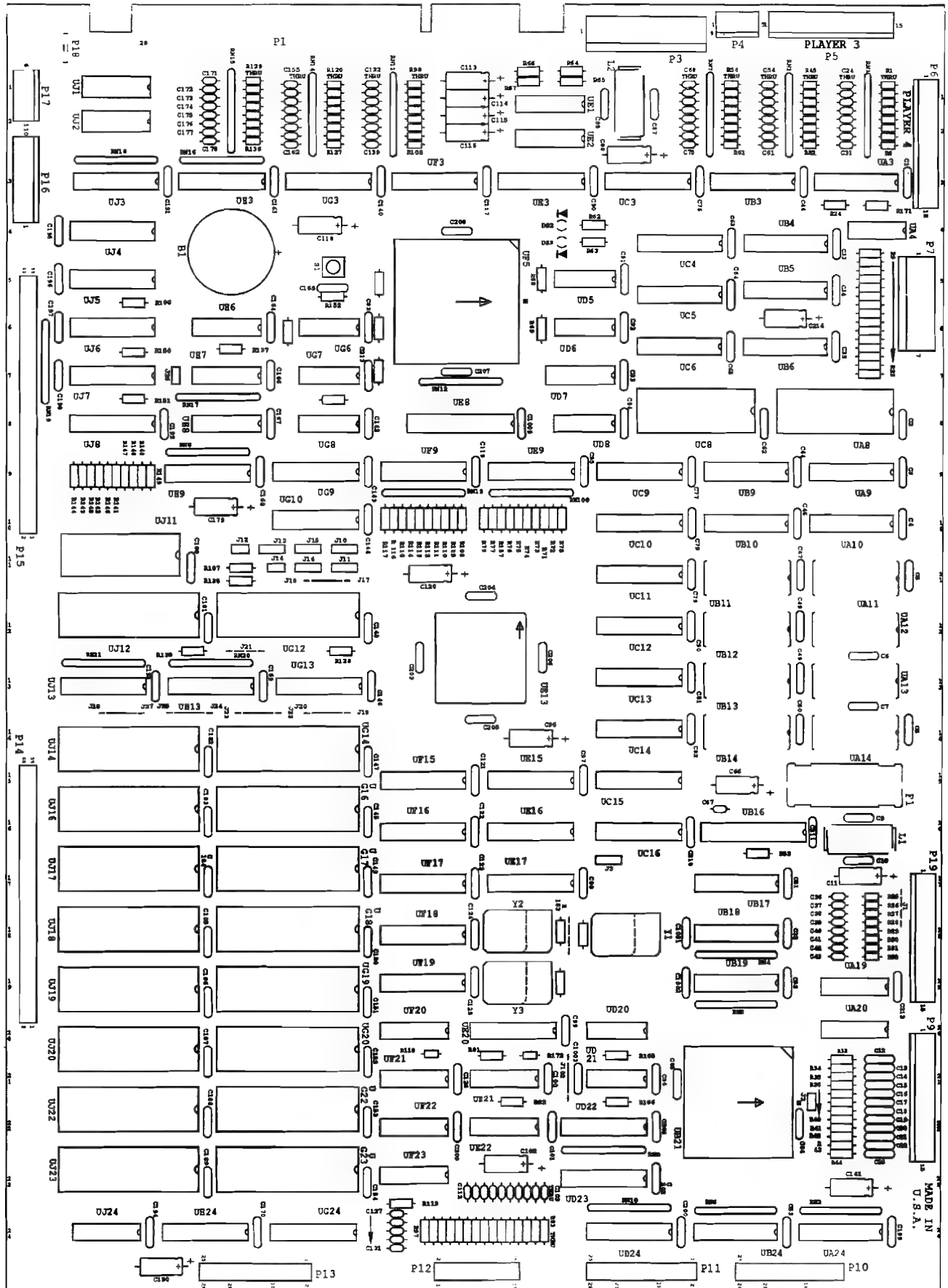
# MORTAL KOMBAT II KIT

S E C T I O N  
two

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Parts

# A-17265-40029 CPU Board Assembly

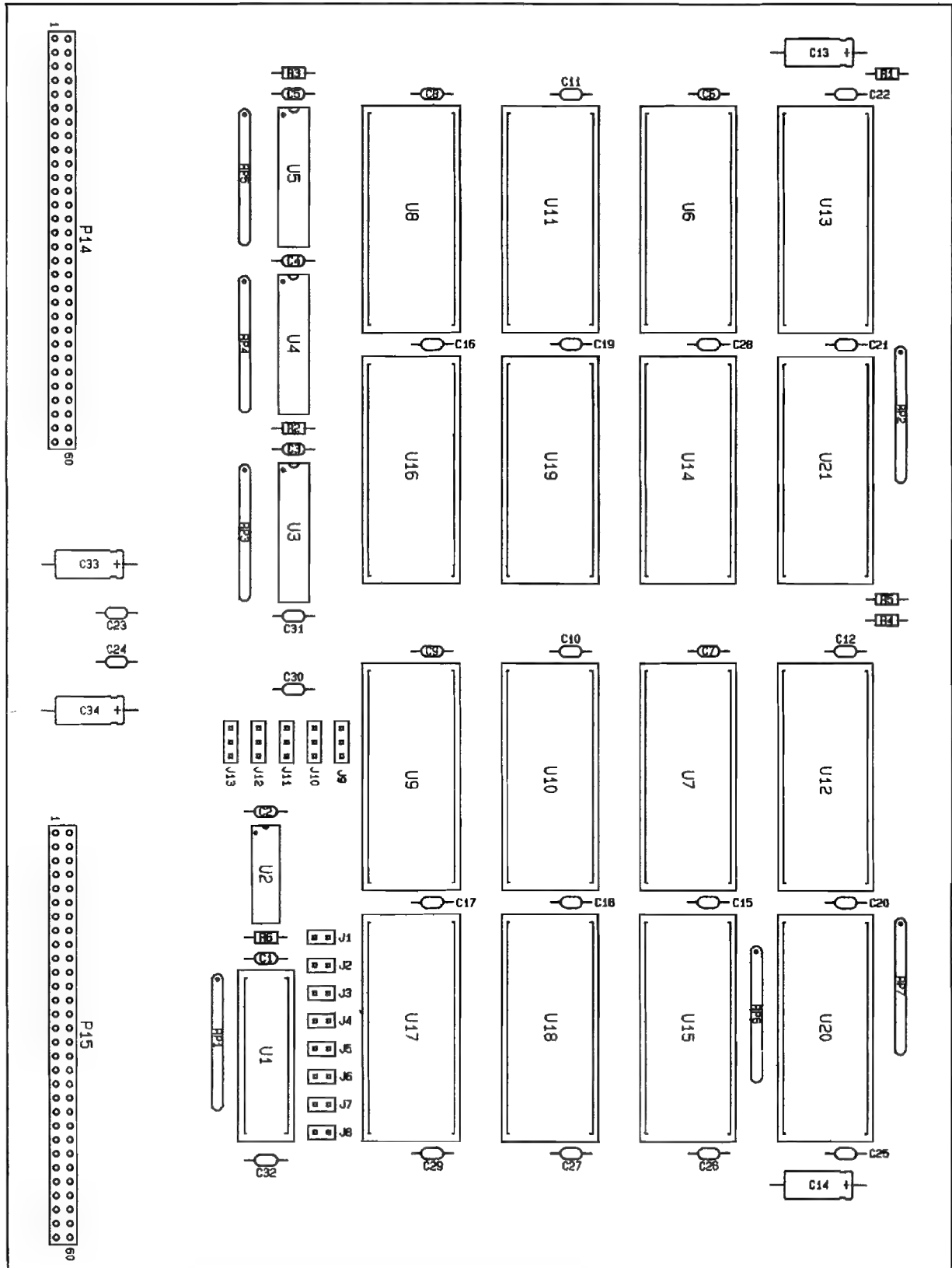


## A-17265-40029 CPU Board Parts

Part Number	Part Designator	Description	Part Number	Part Designator	Description
5434-12255-00	UH6	IC, MAX691	5043-08980-00	C1-C4, C9, C10, C32- C35, C44-C46, C51-C53, C62-C65, C76-C86, C90- C95, C97-C101, C117, C119, C121-C126, C140, C142-C154, C163, C164, C166-C170, C180-C189, C191-C194, C199-C213, C1000	.01uF Cap.,
5370-12602-00	UE1	IC, ULN2064			
5340-12958-00	UE22, UF22, UF23	IC, 26LS31			
5340-12959-00	UE21, UF20, UF21	IC, 26LS32A			
5340-13020-00	UJ4, UJ5, UJ6, UJ7	IC, 44C256			
5340-12558-00	UJ11	IC, 5565			
5340-13322-00	UA8, UC8	IC, 5C2568			
5283-10551-00	UG8	IC, 74F00			
5283-10552-00	UD6	IC, 74F04	5043-08996-00	C5-C8, C47-C50, C195- C198, C1001-C1003	.1uF Cap., 20%
5281-09215-00	UD8	IC, 74LS04			
5280-09309-00	UA4	IC, 7407	5040-09343-00	C11, C66, C88, C96, C102, C115, C116, C118, C120, C141, C179, C190, C214	10uF Cap., 20V
5283-12488-00	UG6	IC, 74F08			
5281-09500-00	UD20	IC, 74LS32			
5321-13466-00	UD21	IC, 74AC74	5671-13732-00	DS2, DS3	LED, Red
5281-09737-00	UD5	IC, 74LS86	5551-09822-00	L2	4.7uH Coil, 3.0A
5281-09745-00	UH8	IC, 74LS138	5880-11056-00	B1	Battery, Lithium 3.0V
5281-13438-00	UH7	IC, 74LS155A	5881-12315-00	B1	Battery Holder
5281-09733-00	UE2	IC, 74LS174	5700-09915-00	UF17	20-pin Socket
5320-13437-00	UD22	IC, 74ACTQ244	5700-12047-00	UE8	24-pin Socket
5283-12890-00	UB24, UD23	IC, 74F244	5700-12088-00	UG12, UG14, UG16-UG20, UG22, UG23, UJ12, UJ14, UJ16-UJ20, UJ22, UJ23	32-pin Socket
5281-09867-00	UG9	IC, 74LS244			
5320-13436-00	UB18, UB19	IC, 74ACTQ245			
5317-12208-00	UB6, UC6, UC11, UC12, UC13, UC14, UE15, UE16, UF15, UF16, UH9, UH13, UJ8, UJ13	IC, 74ALS245	5700-12253-00	UB21	68-pin Socket
			5700-12424-00	UF5	84-pin Socket
5283-12889-00	UA24, UD24	IC, 74F245	5791-12461-05	P4	5-pin Header
5283-13319-00	UD7	IC, 74F253	5791-12461-06	P17	6-pin Header
5283-13320-00	UB9, UF9, UF18, UG10	IC, 74F373	5791-12461-10	P16	10-pin Header
5281-09486-00	UA9, UA10, UB5, UB10, UC5, UC9, UC10, UC15, UC16, UE17, UE20, UF19, UG13	IC, 74LS374	5791-12461-15	P5	15-pin Header
			5791-10862-07	P7	7-pin Header
			5791-10862-09	P3	9-pin Header
5317-12211-00	UB4, UC4	IC, 74ALS541	5791-09437-00	P12	20-pin Header
5315-13435-00	UA3, UB3, UC3, UE3, UF3, UG3	IC, 74HCT541	5019-09669-00	RN4, RN5, RN13	1K $\Omega$ Res. 5%, 1/8W
5281-12887-00	UE9, UH3, UJ3	74LS541	5010-13472-00	J100, J101	47 $\Omega$ Res. 5%, 1/8W
5521-13424-03	UE19	8MHz Oscillator	5010-13473-00	R155	39 $\Omega$ Res. 5%, 1/8W
5521-13424-01	UD18	50MHz Oscillator	5010-13474-00	R158, R167-R170	68 $\Omega$ Res. 5%, 1/8W
5645-09025-00	SW1, SW2	DIP, 8-switch	5641-12551-00	S1	Sw-Push Button
5010-13364-00	R70-R77, R79, R106, R108-R117, R140-R147, R149, R150	33 $\Omega$ Res. 5%, 1/8W	5283-12489-00	UG7	IC, 74F32
5010-13363-00	R24, R69, R82-R97, R119, R128, R137, R148, R151, R171	100 $\Omega$ Res. 5%, 1/8W	5796-13836-00	P14, P15	60-pin Connector
5010-13372-00	R81	220 $\Omega$ Res. 5%, 1/8W	5010-09534-00	J18, J19, J22, J24, J28, R154	0 $\Omega$ Res. Jumper
5010-13371-00	R62, R63, R66, R67	330 $\Omega$ Res. 5%, 1/8W	5400-12220-00	UB21	IC, TMS34010-50
5010-13366-00	R45-R51, R54, R57, R58, R98-R105, R118, R120-R127, R129-R136, R172	470 $\Omega$ Res. 5%, 1/8W	A-16217	UE8	IC, 20L8
5010-13361-00	R13, R14, R19	1K $\Omega$ Res. 2%, 1/8W	5410-13816-00	UF5	IC, 1020A-1
5010-13362-00	R12, R15, R20	2K $\Omega$ Res. 2%, 1/8W	A-17480	UF17	IC, 16L8
5010-13368-00	R11, R16, R21	3.9K $\Omega$ Res. 5%, 1/8W	A-5343-40029-18	UG12	EPROM
5010-13365-00	R53, R107, R138, R139, R152, R157, R165, R166	4.7K $\Omega$ Res. 5%, 1/8W	A-5343-40029-1	UG14	EPROM
5010-13369-00	R10, R17, R22	8.2K $\Omega$ Res. 5%, 1/8W	A-5343-40029-5	UG16	EPROM
5010-13370-00	R9, R18, R23	15K $\Omega$ Res. 5%, 1/8W	A-5343-40029-9	UG17	EPROM
5019-09362-00	RN1-RN3, RN6, RN7, RN9-RN12, RN14-RN18, RN100	4.7K $\Omega$ Res SIP, 5%, 1/8W	A-5343-40029-13	UG18	EPROM
5048-11030-00	C165	470pF Cap., 10%	A-5343-40029-3	UG19	EPROM
5048-13375-00	C54-C60, C67, C68, C71, C72, C103-C112, C127-C139, C155-C162, C171-C178	100pF Cap., 10%	A-5343-40029-7	UG20	EPROM
5048-11031-00	C87, C89	.001uF Cap., 10%	A-5343-40029-11	UG22	EPROM
			A-5343-40029-15	UG23	EPROM
			A-5343-40029-17	UJ12	EPROM
			A-5343-40029-2	UJ14	EPROM
			A-5343-40029-6	UJ16	EPROM
			A-5343-40029-10	UJ17	EPROM
			A-5343-40029-14	UJ18	EPROM
			A-5343-40029-4	UJ19	EPROM
			A-5343-40029-8	UJ20	EPROM
			A-5343-40029-12	UJ22	EPROM
			A-5343-40029-16	UJ23	EPROM
			5410-12862-00	UE13	IC, DMA2
			5340-13321-00	UA11-UA14, UB11-UB14	IC, 48121, 80nsec

Notes: 1. See Section 3 For Schematic; 2. \* = Not for individual sale.

# **A-17264-40029** **Memory Expansion Board Assembly**



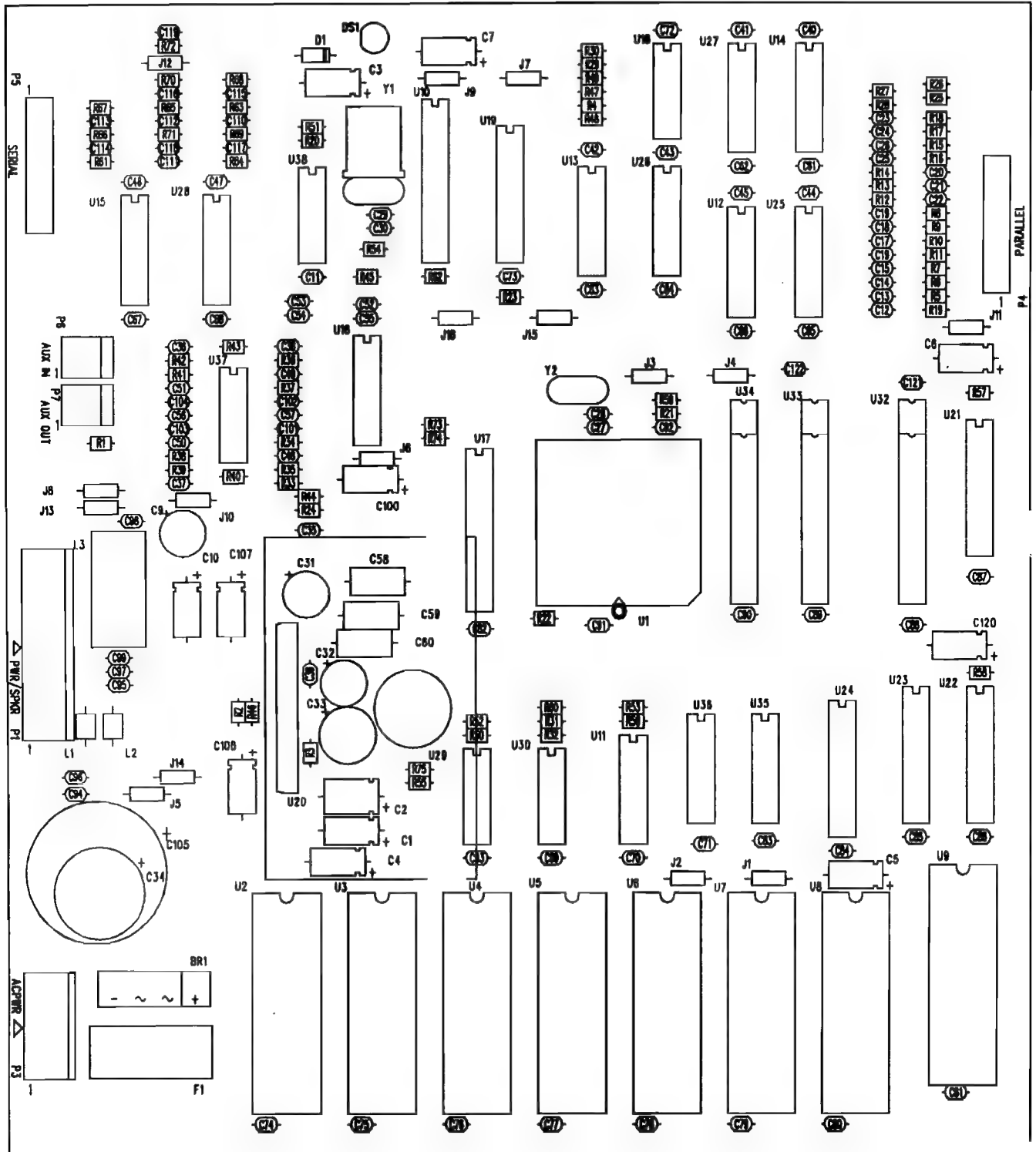


## A-17264-40029

### Memory Expansion Board Parts

Part Number	Part Designator	Description
5043-08980-00	C1-C12, C15-C32	01 $\mu$ f Cap. 50V
5040-09343-00	C13, C14, C33, C34	10 $\mu$ f Cap. 16V
5010-13365-00	R1, R6	4.7K $\Omega$ Res. 1/8W, 5%
5010-13363-00	R2-R5	100 $\Omega$ Res. 1/8W, 5%
5019-09367-00	RP3-RP7	4.7 $\Omega$ SIP Res. 9R, 10 pin
5320-13437-00	U3-U5	IC, 74ACTQ244
5700-12088-00	U6-U21	32-pin Socket, .600
5796-13837-00	P14, P15	60-pin Connector Header
A-5343-40029-19	U8	EPROM
A-5343-40029-20	U9	EPROM
A-5343-40029-21	U6	EPROM
A-5343-40029-22	U7	EPROM
A-5343-40029-23	U11	EPROM
A-5343-40029-24	U10	EPROM
A-5343-40029-25	U13	EPROM
A-5343-40029-26	U12	EPROM

# **A-17319-40029** **Sound Board Assembly**



## A-17319-40029 Sound Board Parts

Part Number	Part Designator	Description	Part Number	Part Designator	Description
20-9915	J5, J8, J10, J13	Wire Insulated Jumper	5280-08974-00	U29	IC, 7406
5010-09534-00	J1, J4, J6, J7, J15	0 $\Omega$ Res., 1/4W	5281-09486-00	U19	IC, 74LS374
5010-13363-00	R45, R48, R49, R51, R57-R60	100 $\Omega$ Res., 5%	5281-09487-00	U18	IC, 74LS74
5010-13365-00	R21-R23, R25-R29, R31, R32, R50, R53, R55, R56, R73-R75	4.7K $\Omega$ Res., 5%	5283-10551-00	U30	IC, 74F00
5010-13366-00	R4	470 $\Omega$ Res., 5%	5311-10948-00	U11	IC, 74HC138
5010-13371-00	R52	330 $\Omega$ Res., 5%	5311-12043-00	U35, U36	IC, 74HC174
5010-13372-00	R47	220 $\Omega$ Res., 5%	5311-12287-00	U21-U23	IC, 74HC541
5010-13472-00	R5-R19	47 $\Omega$ Res., 5%	5311-12538-00	U38	IC, 74HC14
5010-13361-00	R1	1K $\Omega$ Res., 1/8W, 2%	5320-13436-00	U24	IC, 74ACTQ245
5013-13842-00	R33-R44	6.19K $\Omega$ Res., 1%	5340-12958-00	U25-U27	IC, 26LS31
5010-13841-00	R24	47K $\Omega$ Res., 5%, 200V	5340-12959-00	U12-U14	IC, 26LS32A
5010-13844-00	R3, R20	100K $\Omega$ Res., 5%, 200V	5340-13304-00	U32-U34	IC, SRAM, 2Kx8
5010-13858-00	R2	820 $\Omega$ Res., 1/8W, 5%	5370-12730-00	U37	IC, TL084
5010-13370-00	R46	15K $\Omega$ Res., 1/8W, 5%	5370-13308-00	U20	IC, MB3731 SIP
5040-09332-00	C2	47 $\mu$ f Cap., $\pm$ 20%, Axial	5371-13299-00	U16	IC, AD1851
5040-09343-00	C1, C2, C4-C7, C10, C100, C106, C107, C120	10 $\mu$ f Cap., $\pm$ 20%, Axial	5520-13301-00	Y2	10MHz Crystal
5043-08980-00	C39-C45	.01 $\mu$ f Cap., +80%/-20%, Axial	5551-09822-00	L3	4.7 $\mu$ H Inductor
5043-08996-00	C3, C52-C57, C61-C61, C69-C99, C121, C122	.1 $\mu$ f Cap., $\pm$ 20%, Axial	5556-12513-00	L1, L2	Ferrite Bead
5045-12926-00	C58-C60	.1 $\mu$ f Cap., $\pm$ 10%, Axial Film	5671-13732-00	DS1	Display LED, Red
5048-11028-00	C27, C28	22pf Cap., $\pm$ 20%, Axial	5700-12088-00	U2-U9	32-pin Socket
5048-13375-00	C11-C26	100pf Cap., $\pm$ 20%, Axial	5700-12253-00	U1	68-pin Socket
5048-13608-00	C51	6800pf Cap., 5%, Axial	5700-12047-00	U17	24-pin Socket
5048-13609-00	C48-C50	3900pf Cap., 5%, Axial	5791-09437-00	P4	100 C 10 x 2
5048-13610-00	C35-C38	1000pf Cap., $\pm$ 20%, Axial	5791-10862-02	P6, P7	2H Str Sq Pin .156
5048-13611-00	C101-C104	680pf Cap., $\pm$ 20%, Axial	5791-10862-05	P3	5H Str Sq Pin .156
5070-08919-00	D5	Diode, 1N4148	5791-10862-09	P1	9H Str Sq Pin .156
01-10516		Heat Sink	5400-13298-00	U1	IC, ADSP2105 PLCC
			A-17481	U17	IC, PLD GAL20V8, 25ns
			A-5343-40029-35	U2	EPROM
			A-5343-40029-36	U3	EPROM
			A-5354-40029-37	U4	EPROM
			A-5343-40029-38	U5	EPROM
			A-5343-40029-39	U6	EPROM
			A-5343-40029-40	U7	EPROM

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# **MORTAL KOMBAT II KIT**

## **S E C T I O N three**

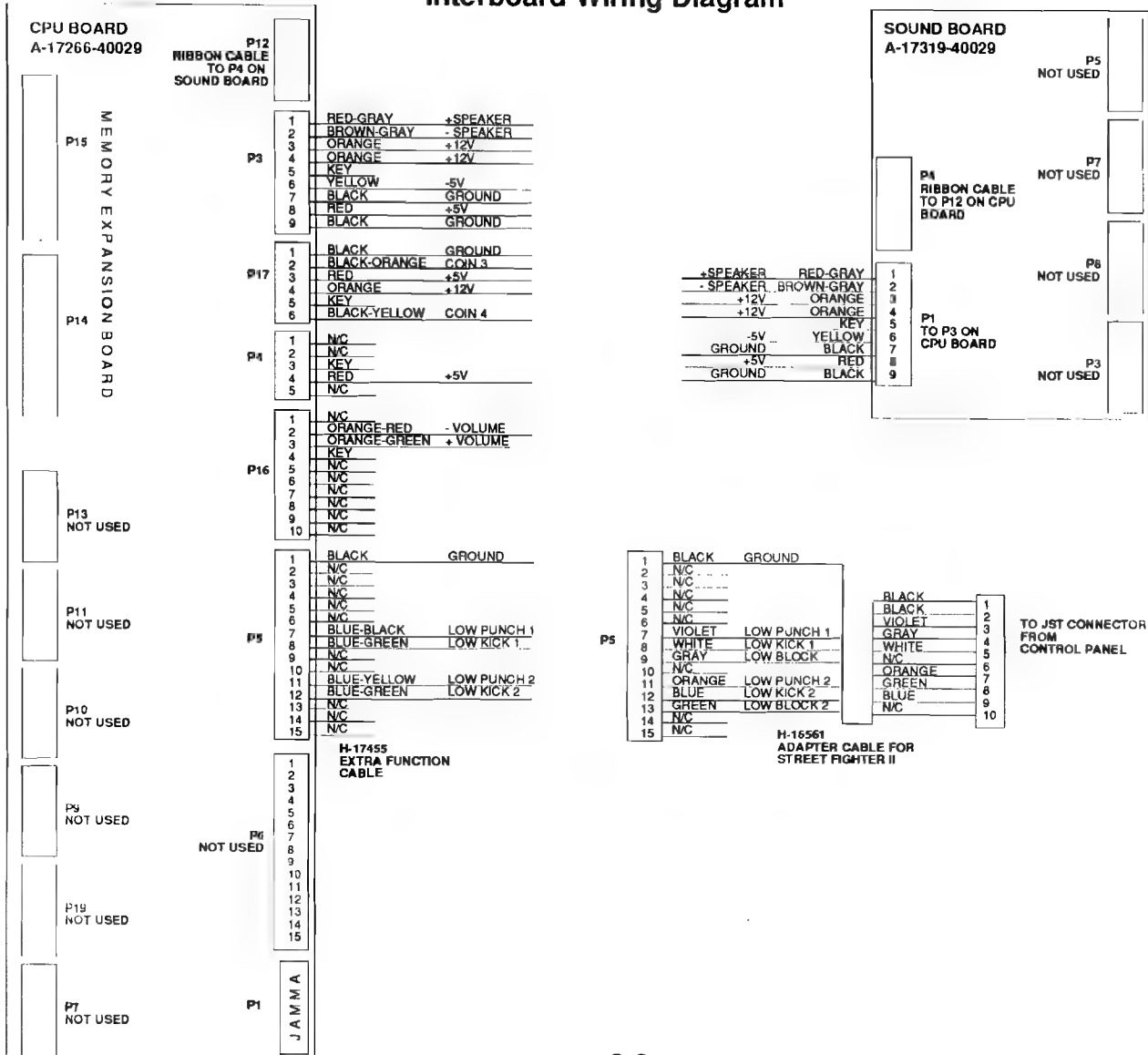
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### **Schematics and Wiring Diagrams**

## JAMMA Chart

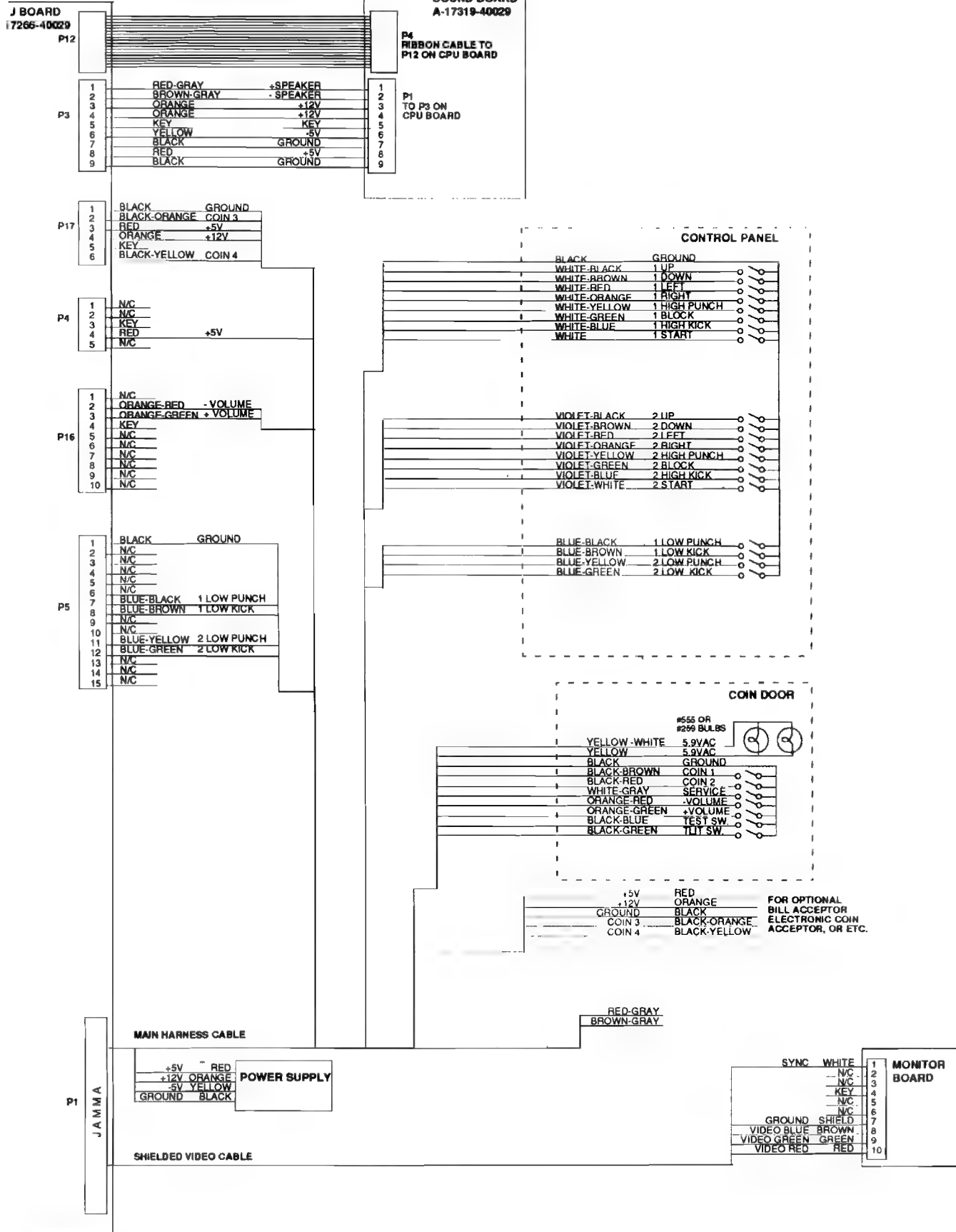
Function	Wire Color	Pin	Pin	Wire Color	Function
Ground	Black	1	A	Black	Ground
Ground	Black	2	B	Black	Ground
+5 Volts DC	Red	3	C	Red	+5 Volts DC
+5 Volts DC	Red	4	D	Red	+5 Volts DC
-5 Volts DC	Yellow	5	E	Yellow	-5 Volts DC
+12 Volts DC	Orange	6	F	Orange	+12 Volts DC
	Key	7	H	Key	
Meter 1	Brown-Red	8	J	Brown	Meter 2
	N/C	9	K	N/C	
Speaker (+)	Red-Gray	10	L	Brown-Gray	Speaker (-)
	N/C	11	M	N/C	
Video Red	Red	12	N	Green	Video Green
Video Blue	Brown	13	P	White	Video Sync
Video Ground	Shield	14	R	White-Gray	Service Switch
Test Switch	Black-Blue	15	S	Black-Green	Tilt Switch
Coin 1	Black-Brown	16	T	Black-Red	Coin 2
Start 1	White	17	U	Violet-White	Start 2
1 Up	White-Black	18	V	Violet-Black	2 Up
1 Down	White-Brown	19	W	Violet-Brown	2 Down
1 Left	White-Red	20	X	Violet-Red	2 Left
1 Right	White-Orange	21	Y	Violet-Orange	2 Right
1 High Punch	White-Yellow	22	Z	Violet-Yellow	2 High Punch
1 Block	White-Green	23	a	Violet-Green	2 Block
1 High Kick	White-Blue	24	b	Violet-Blue	2 High Kick
N/C	White-Violet	25	c	Violet	N/C
	N/C	26	d	N/C	
	N/C	27	e	N/C	
Ground	Black	28	f	Black	Ground

## Interboard Wiring Diagram

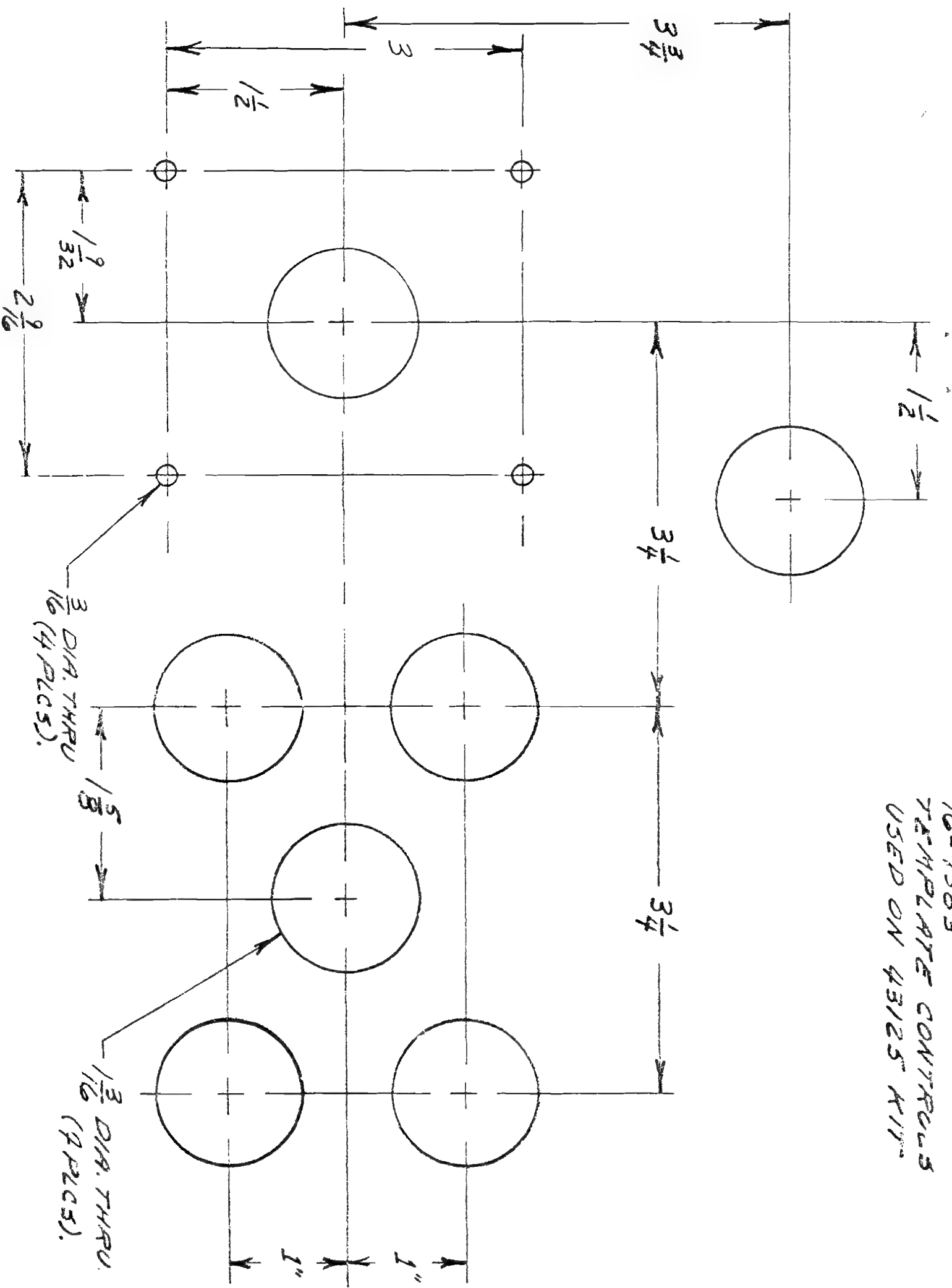


# Cabinet Wiring Diagram

NOTE: Red line on ribbon cable must go to pin 1 on both boards. Ribbon cable may need to be twisted to accomplish this.



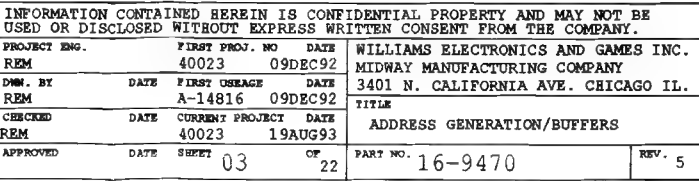
16-9383  
TEMPERATURE CONTROLS  
USED ON 43125 A11-

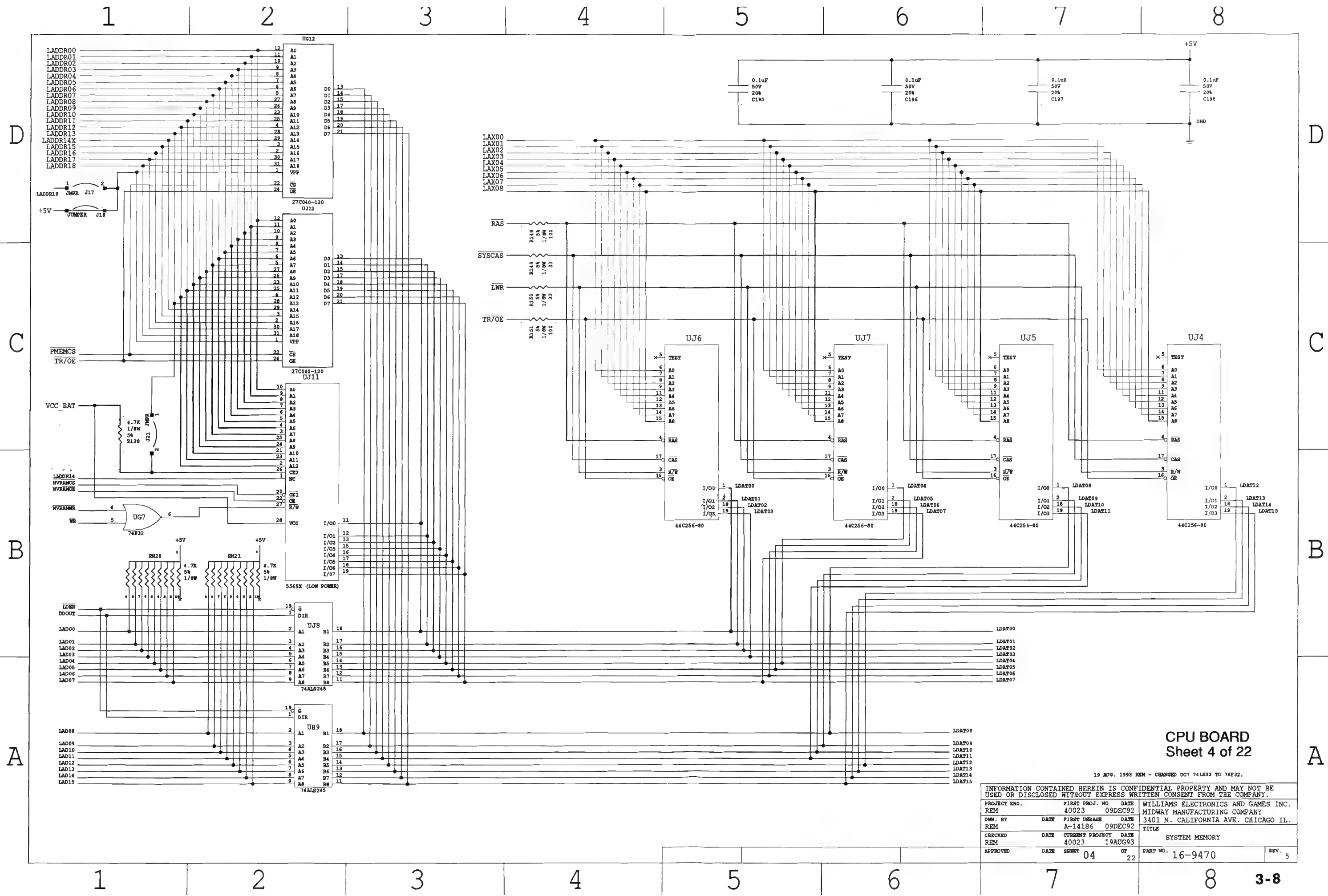








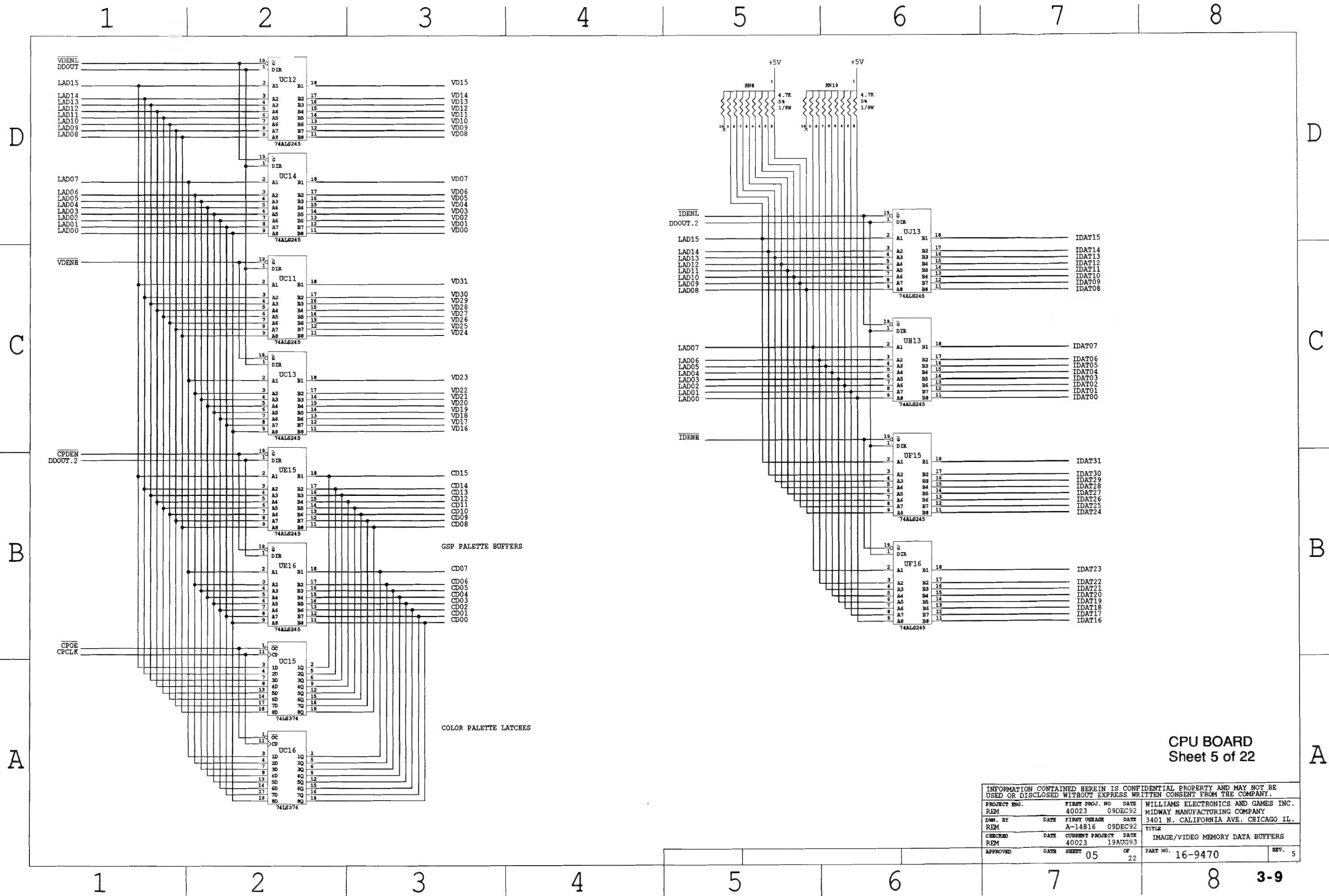




CPU BOARD  
Sheet 4 of 22

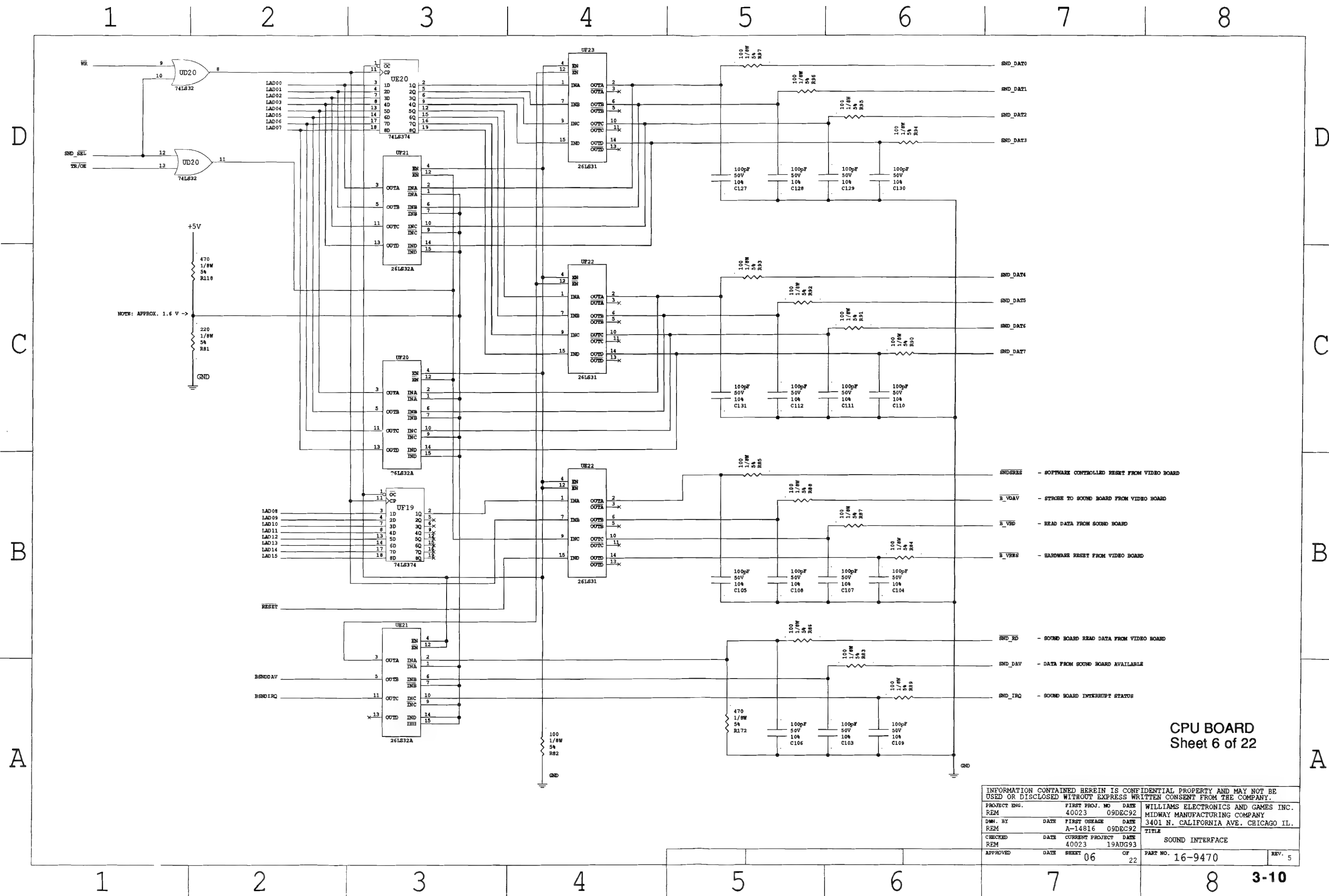
19 AUG. 1993 REM - CHANGED UG7 74LS32 TO 74F32.

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
REM	40023	09DEC92	
DWN. BY	DATE	FIRST USAGE	TITLE
REM	A-14186	09DEC92	
CHECKED	DATE	CURRENT PROJECT	SYSTEM MEMORY
REM	40023	19AUG93	
APPROVED	DATE	SHEET 04 OF 22	PART NO. 16-9470
			REV. 5



CPU BOARD  
Sheet 5 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.	FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC.		
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY		
DWN. BY	DATE	FIRST USAGE	DATE	3401 N. CALIFORNIA AVE. CHICAGO IL.	
REM	A-14816	09DEC92	TITLE	IMAGE/VIDEO MEMORY DATA BUFFERS	
CHECKED	DATE	CURRENT PROJECT	DATE	PART NO. 16-9470	
REM	40023	19AUG93	REV.	5	
APPROVED	DATE	SHEET 05	OF 22	3-9	



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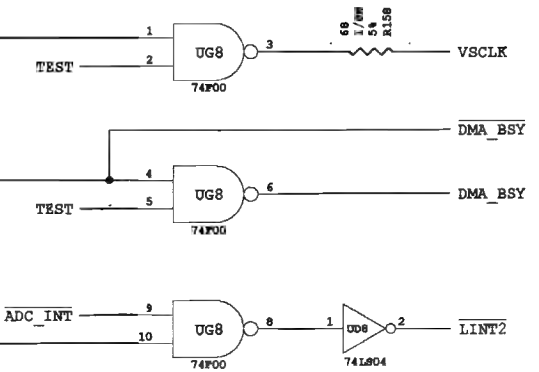
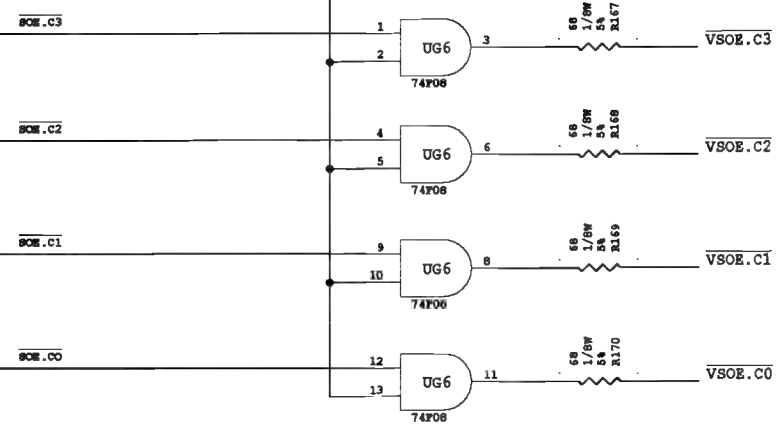
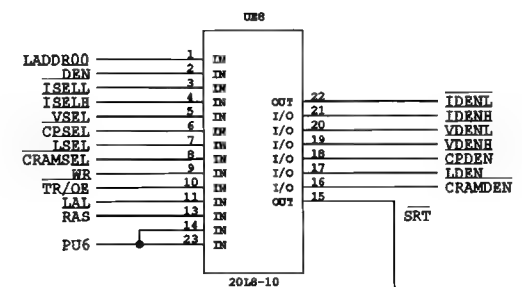
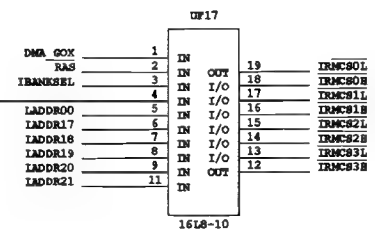
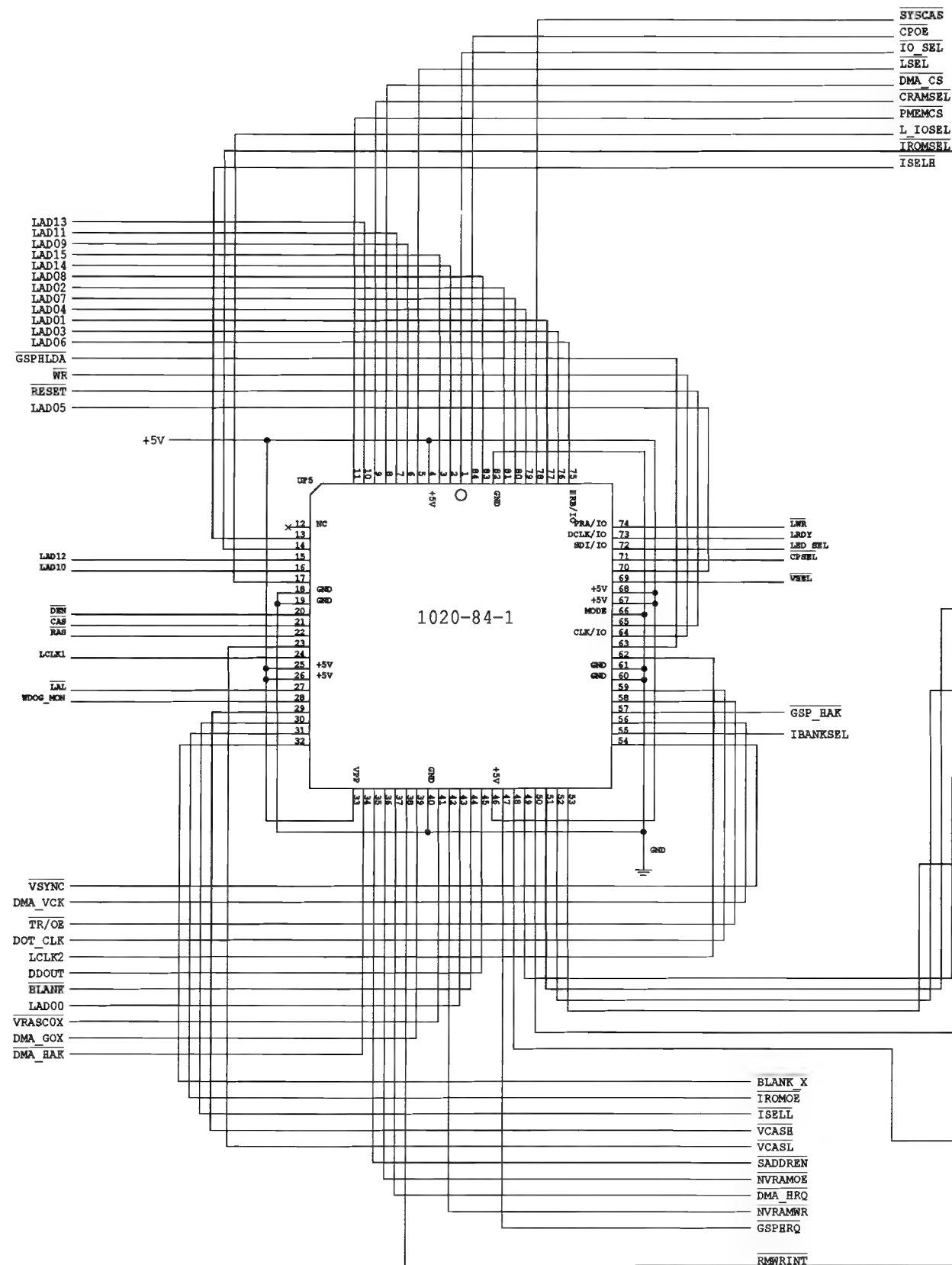
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CPU BOARD  
Sheet 7 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	FIRST PROJ. NO.	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DWN. BY	DATE	FIRST USAGE	DATE
REM	A-14816	09DEC92	3401 N. CALIFORNIA AVE., CHICAGO IL.
CHECKED	DATE	CURRENT PROJECT	DATE
REM	40023	19AUG93	
APPROVED	DATE	SHEET	CF
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PART NO. 16-9470			REV. 5

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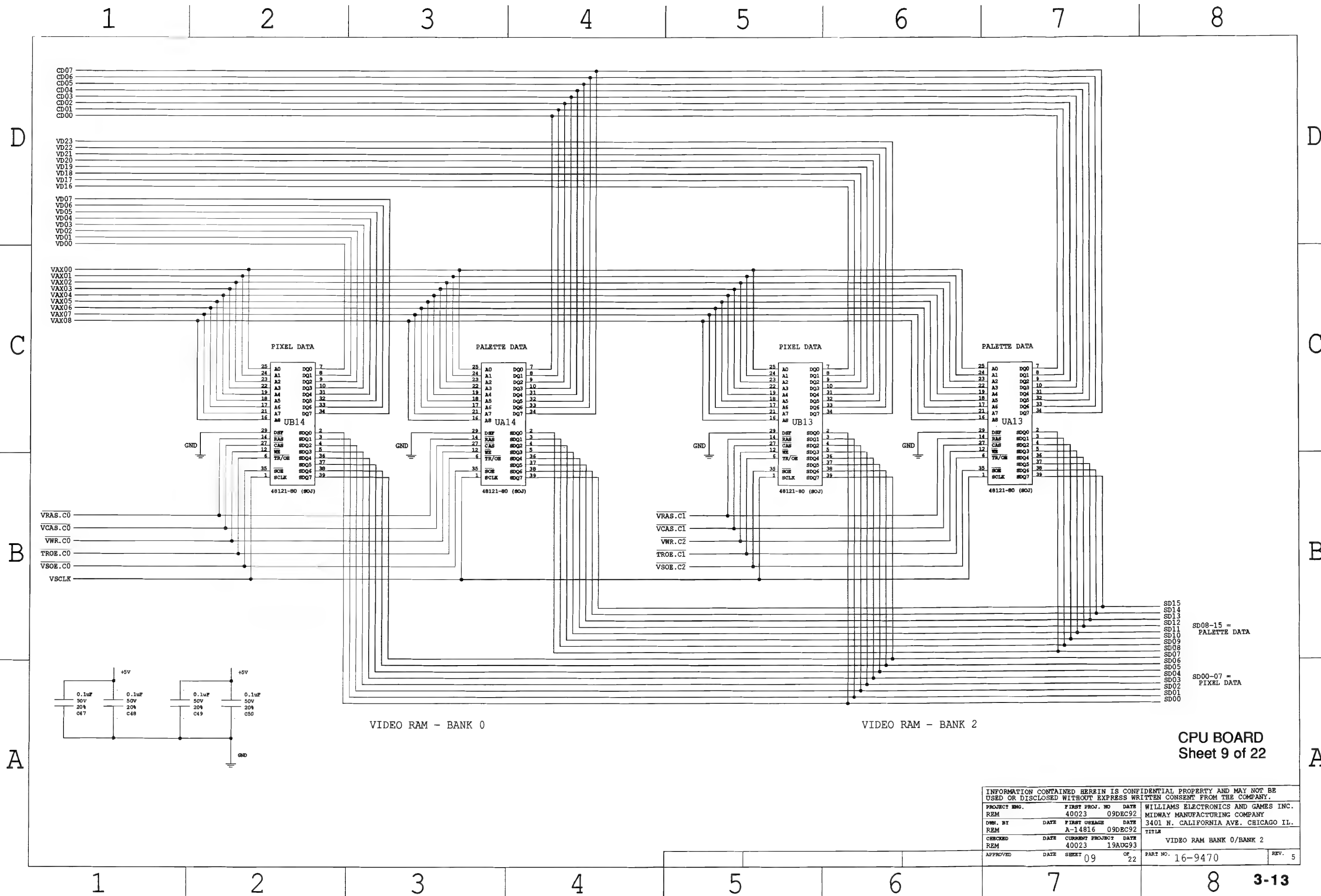
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CPU BOARD  
Sheet 9 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.				WILLIAMS ELECTRONICS AND GAMES INC.	
PROJECT ENG.	FIRST PROJ. NO	DATE		40023	09DEC92
REM				MIDWAY MANUFACTURING COMPANY	
DWN. BY	DATE	FIRST USAGE	DATE	A-14816	09DEC92
REM				3401 N. CALIFORNIA AVE. CHICAGO IL.	
CHECKED	DATE	CURRENT PROJECT	DATE		
REM				40023	19AUG93
APPROVED	DATE	SHEET	OF	PART NO.	REV.
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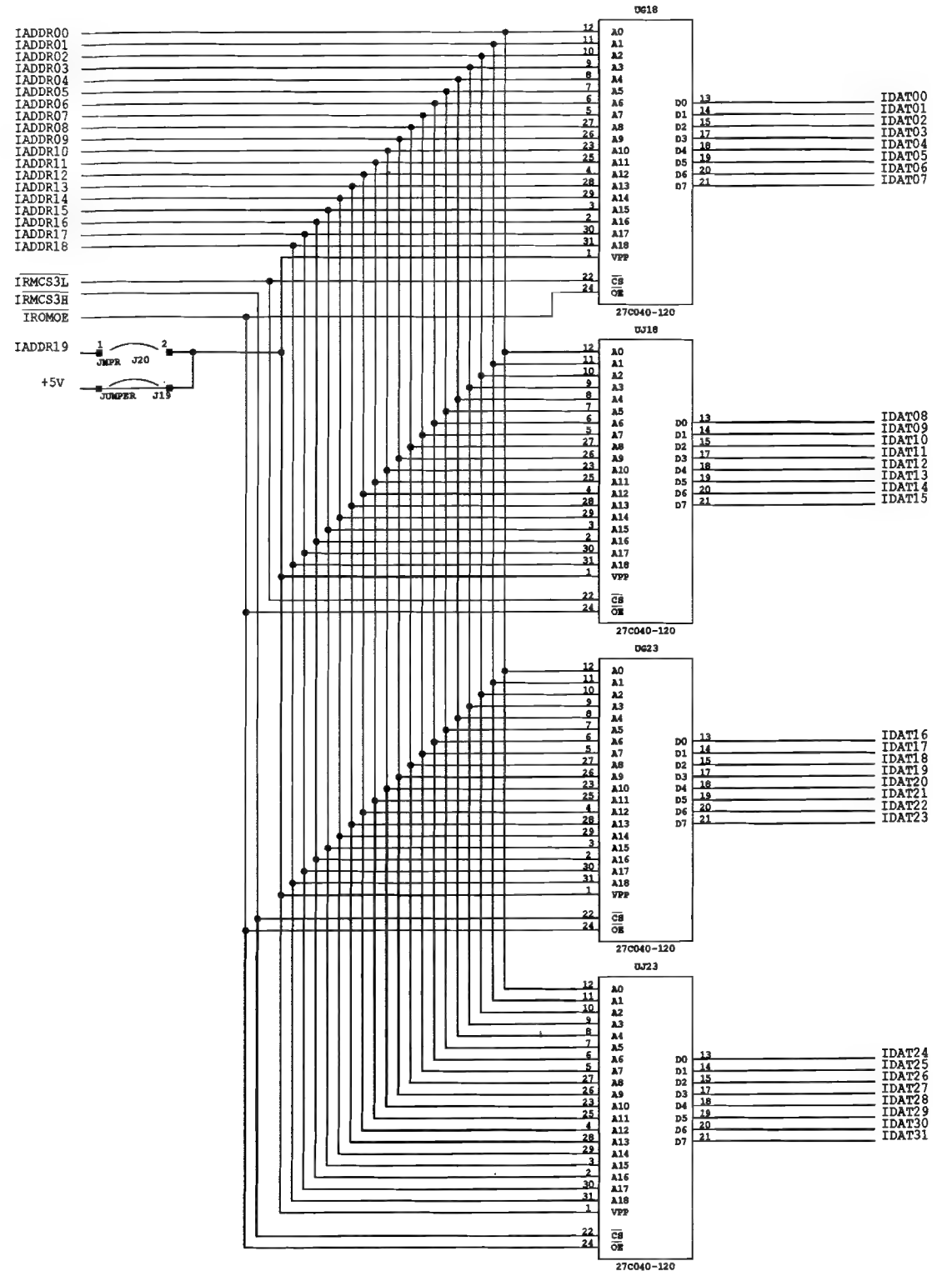
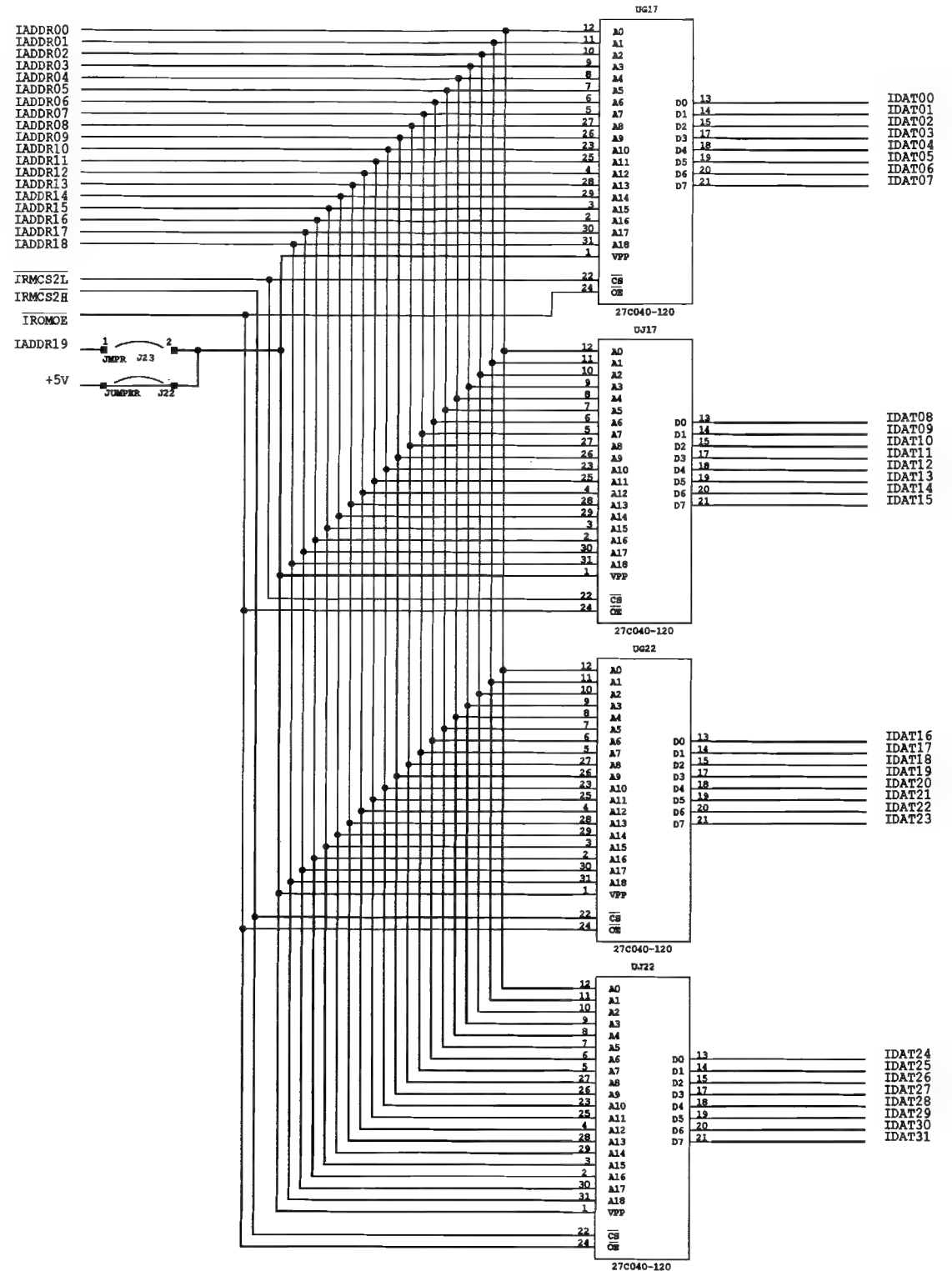
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CPU BOARD  
Sheet 12 of 22

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PROJECT ENG.	FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY
OWN. BY	DATE	FIRST USAGE	DATE
REM	A-14816	09DEC92	3401 N. CALIFORNIA AVE. CHICAGO IL.
CHECKED	DATE	CURRENT PROJECT	DATE
REM	40023	19AUG93	IMAGE ROM BANK 2/BANK 3
APPROVED	DATE	SHEET	PART NO.
		12 OF 22	16-9470
			REV. 5



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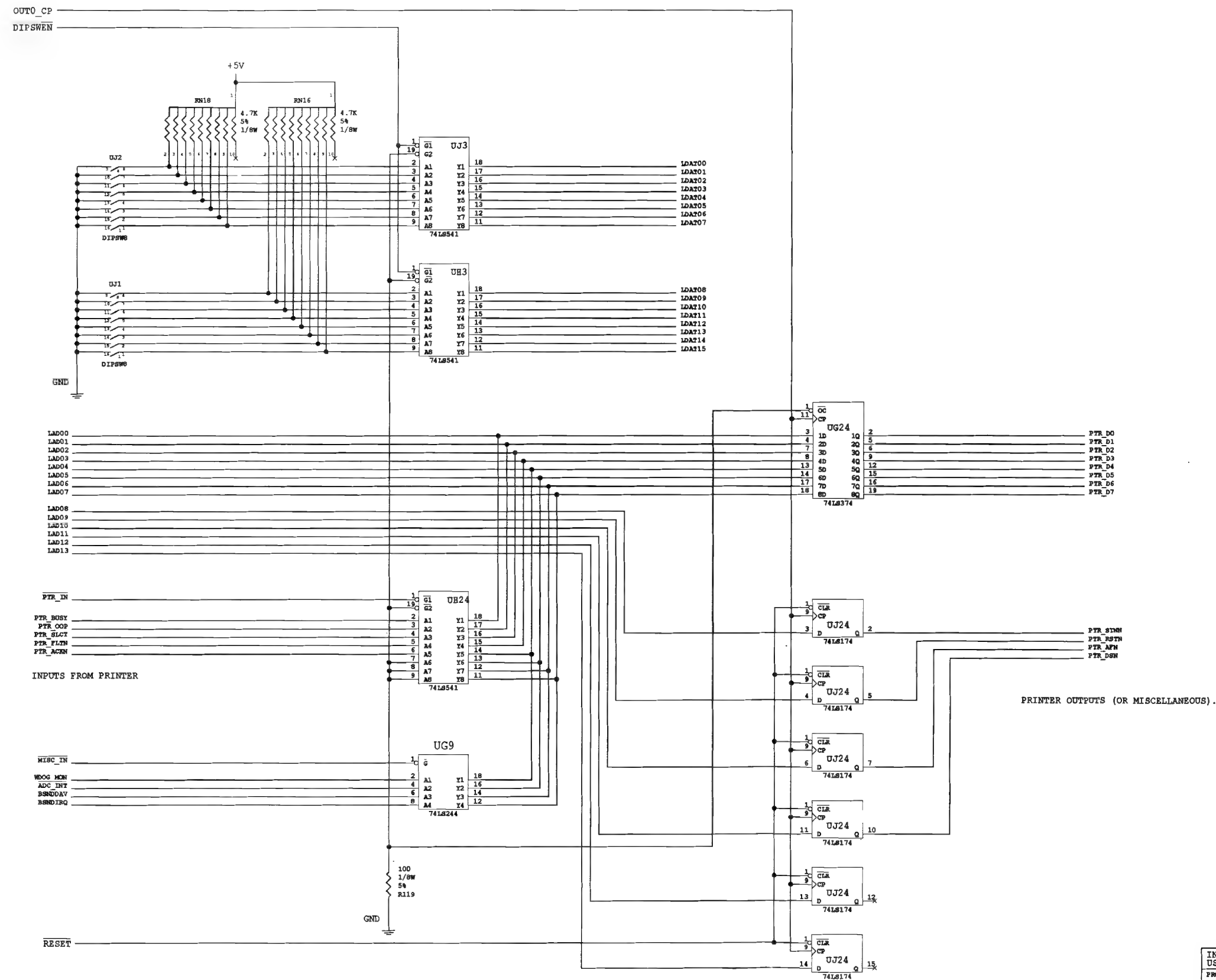
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CPU BOARD  
Sheet 14 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.	DATE	FIRST PROJ. NO.	DATE	WILLIAMS ELECTRONICS AND GAMES INC.	
REM	40023	09DEC92		MIDWAY MANUFACTURING COMPANY	
DES. BY	DATE	FIRST USAGE	DATE	3401 N. CALIFORNIA AVE. CHICAGO IL.	
REM	A-14816	09DEC92		TITLE	
CHECKED	DATE	CURRENT PROJECT	DATE	MISC. I/O AND DIP SWITCH	
REM	40023	19AUG93		PART NO. 16-9470	
APPROVED	DATE	SHEET	14	OF	22
					REV. 5

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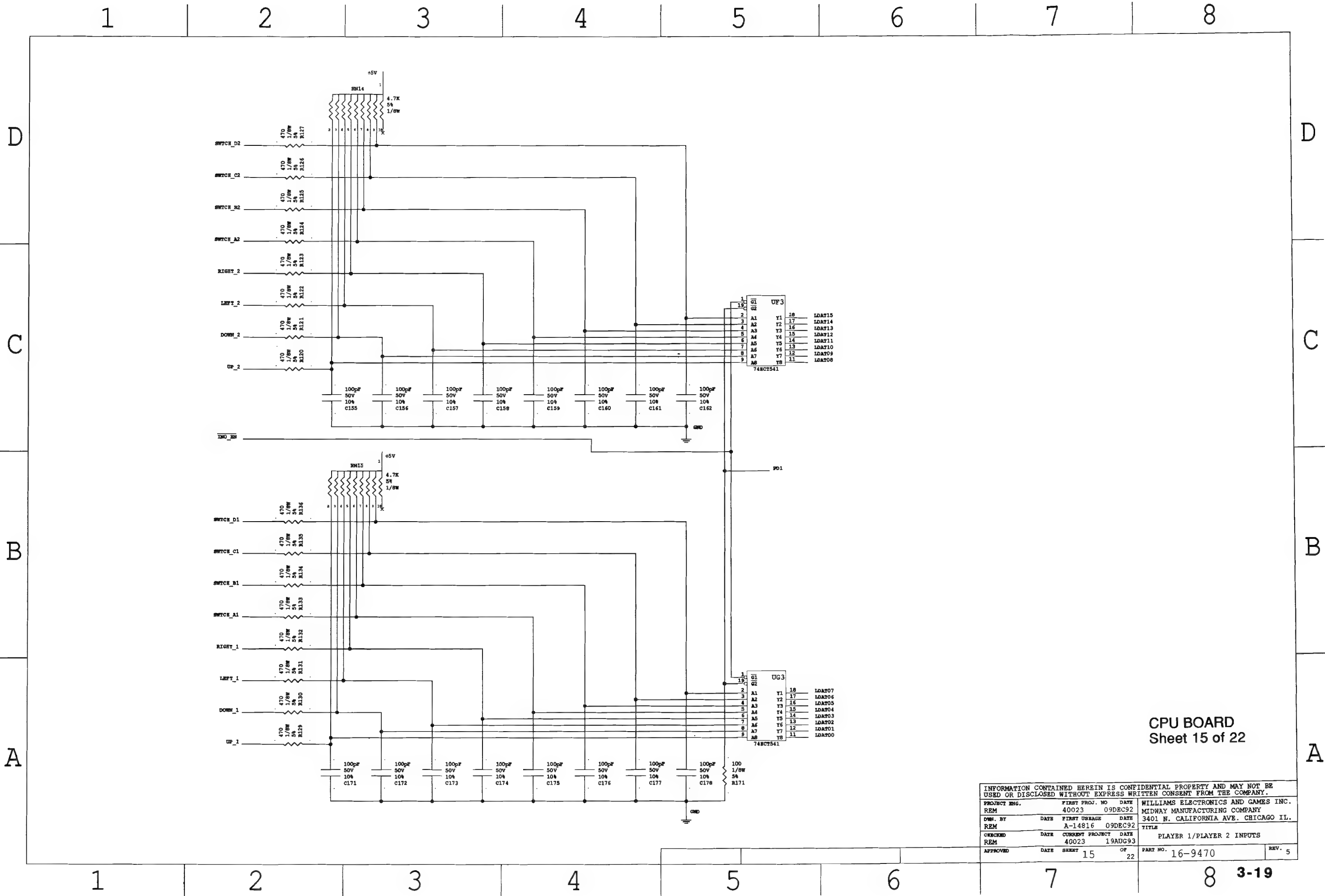
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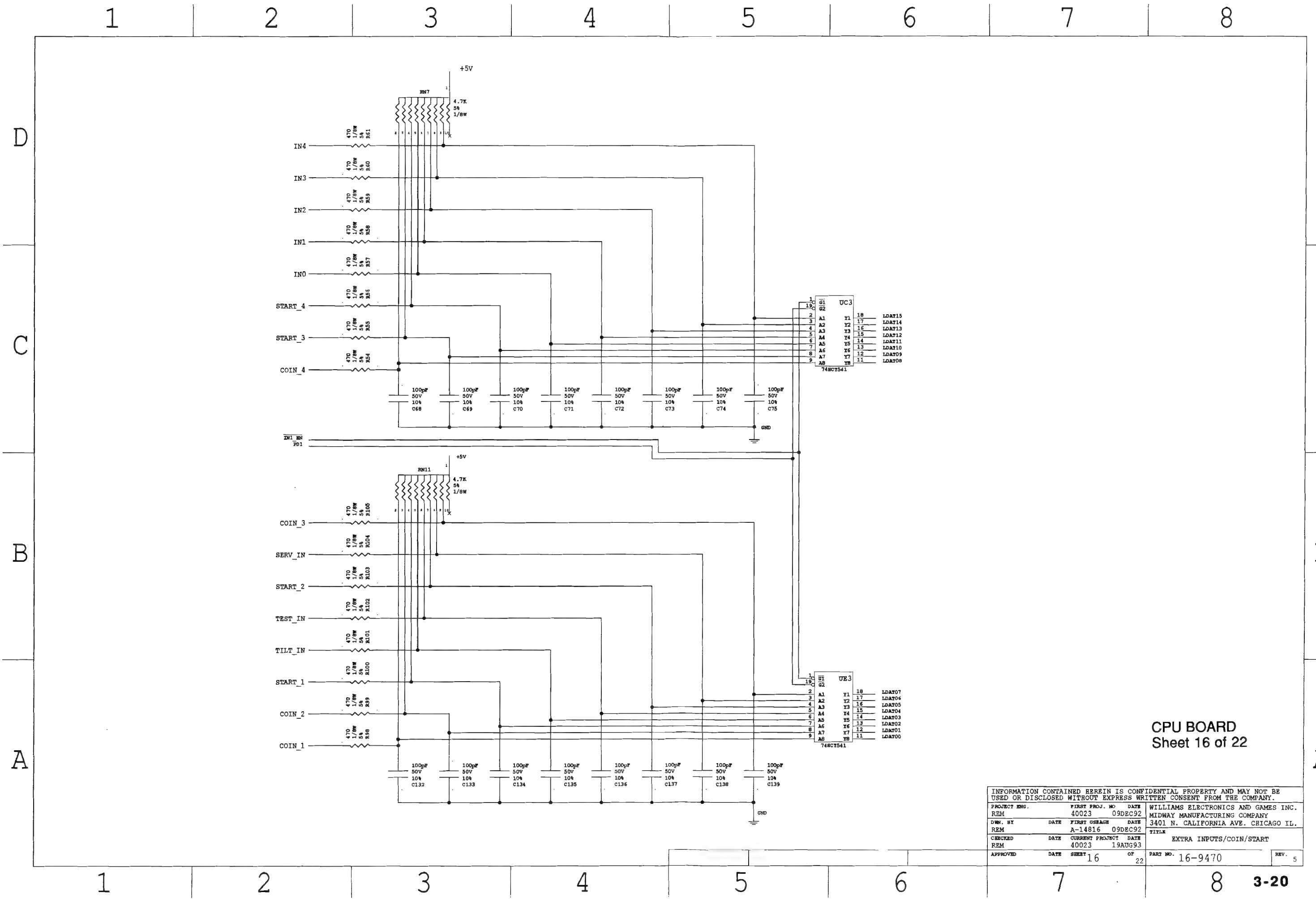
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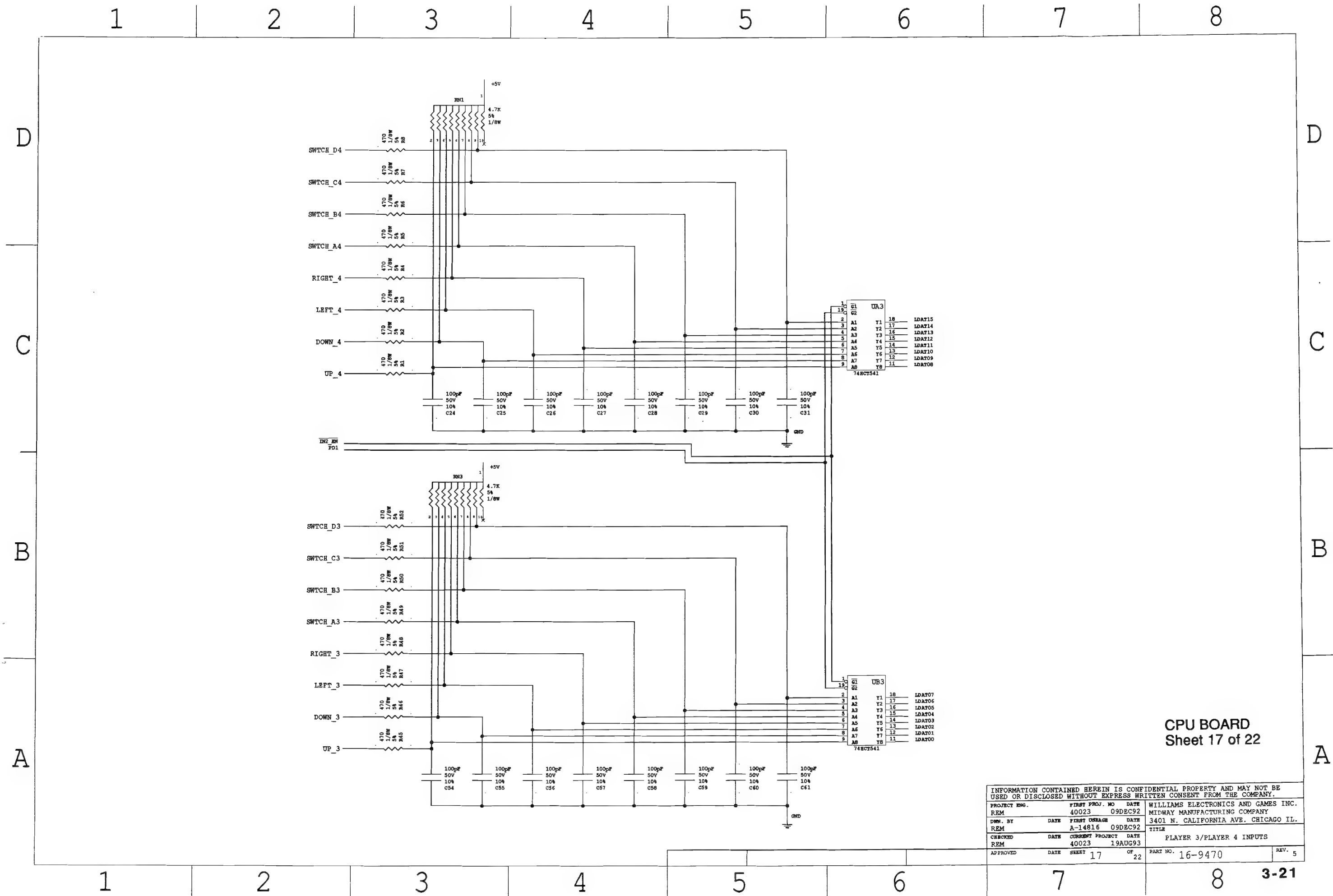
CPU BOARD  
Sheet 15 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
REM	40023	09DEC92	
DWN. BY	DATE	FIRST USAGE	TITLE
REM	A-14816	09DEC92	
CHECKED	DATE	CURRENT PROJECT	PLAYER 1/PLAYER 2 INPUTS
REM	40023	19AUG93	
APPROVED	DATE	SHEET	PART NO.
		15	16-9470
		OF 22	REV. 5



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PROJECT ENG.	FIRST PROJ. NO.	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DWN. BY	DATE	FIRST USAGE	DATE
REM	A-14816	09DEC92	3401 N. CALIFORNIA AVE. CHICAGO IL.
CHECKED	DATE	CURRENT PROJECT	DATE
REM	40023	19AUG93	
APPROVED	DATE	SHEET	OF
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PART NO.		16-9470	REV. 5





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PROJECT ENG.		FIRST PROJ. NO		DATE		WILLIAMS ELECTRONICS AND GAMES INC.			
REM		40023		09DEC92		MIDWAY MANUFACTURING COMPANY			
DWN. BY		DATE		FIRST USAGE		3401 N. CALIFORNIA AVE. CHICAGO IL.			
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CHECKED		DATE		CURRENT PROJECT DATE		PLAYER 3/PLAYER 4 INPUTS			
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APPROVED		DATE		SHEET 17 OF 22		PART NO. 16-9470		REV. 5	

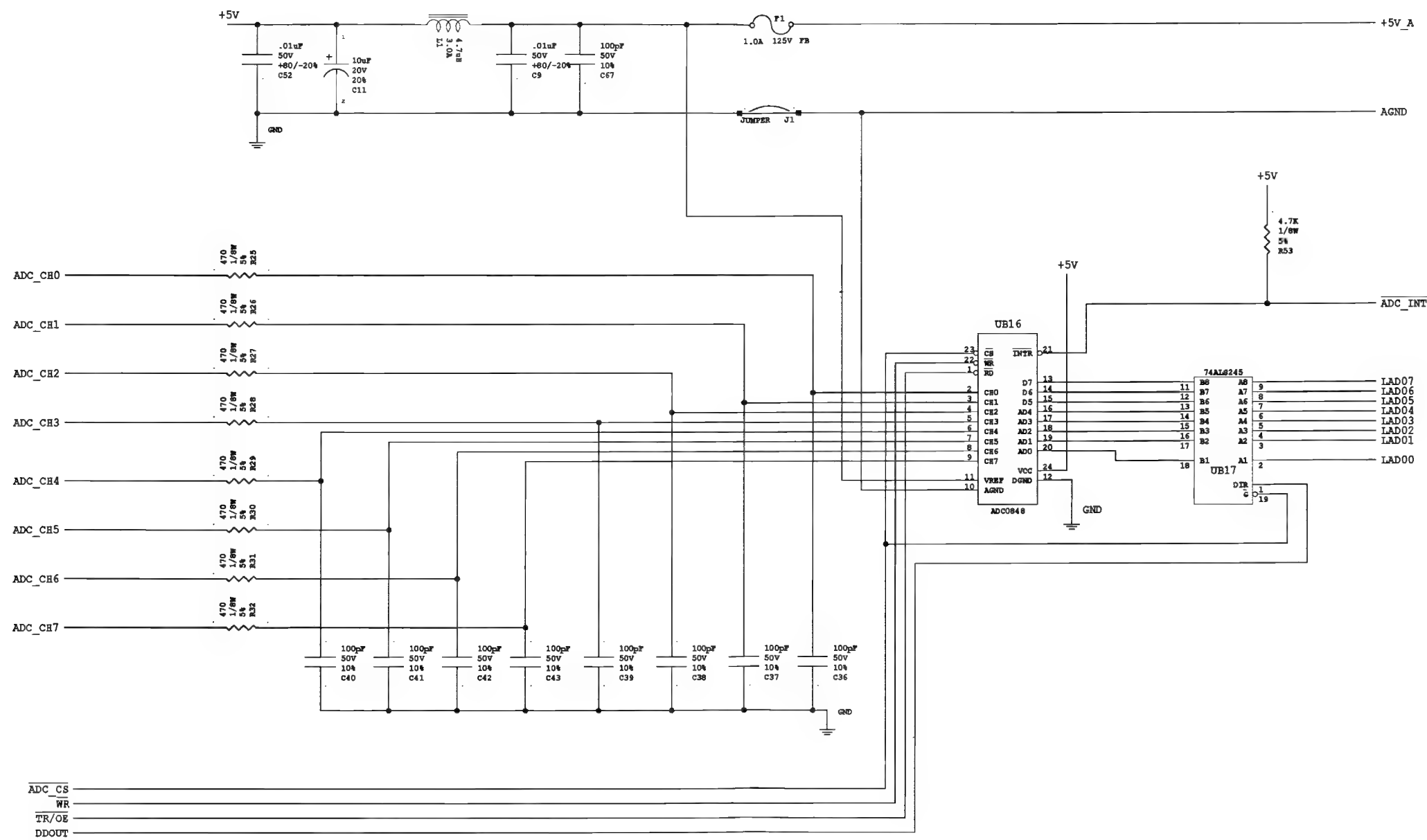
1 2 3 4 5 6 7 8

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CPU BOARD  
Sheet 18 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.									
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REM	40023	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92
DWN. BY	DATE	FIRST USAGE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
REM	A-14816	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92	09DEC92
CHECKED	DATE	CURRENT PROJECT	DATE	DATE	DATE	DATE	DATE	DATE	DATE
REM	40023	19AUG93	19AUG93	19AUG93	19AUG93	19AUG93	19AUG93	19AUG93	19AUG93
APPROVED	DATE	SHEET	18	OF	22	PART NO.	16-9470	REV.	5

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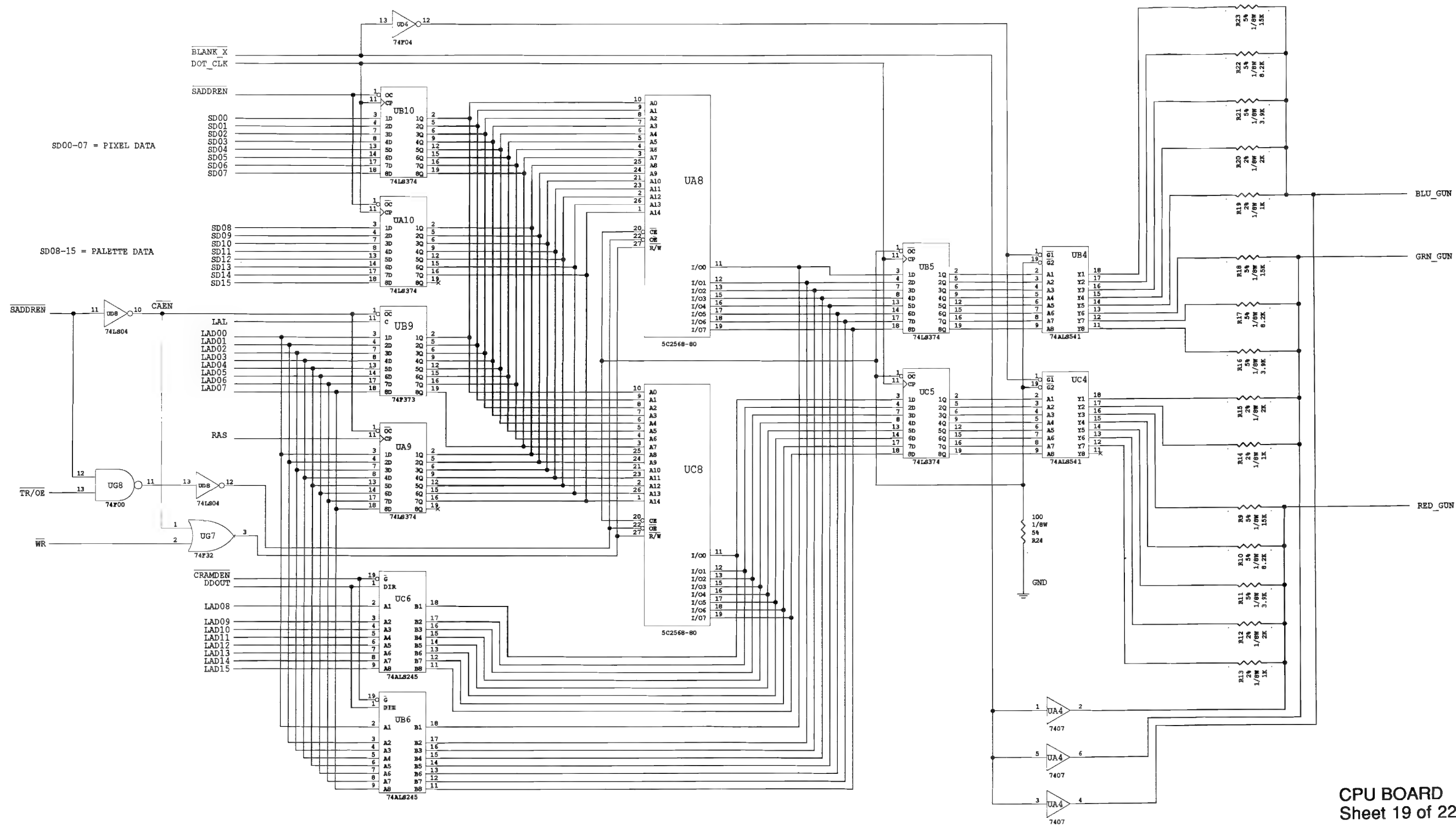
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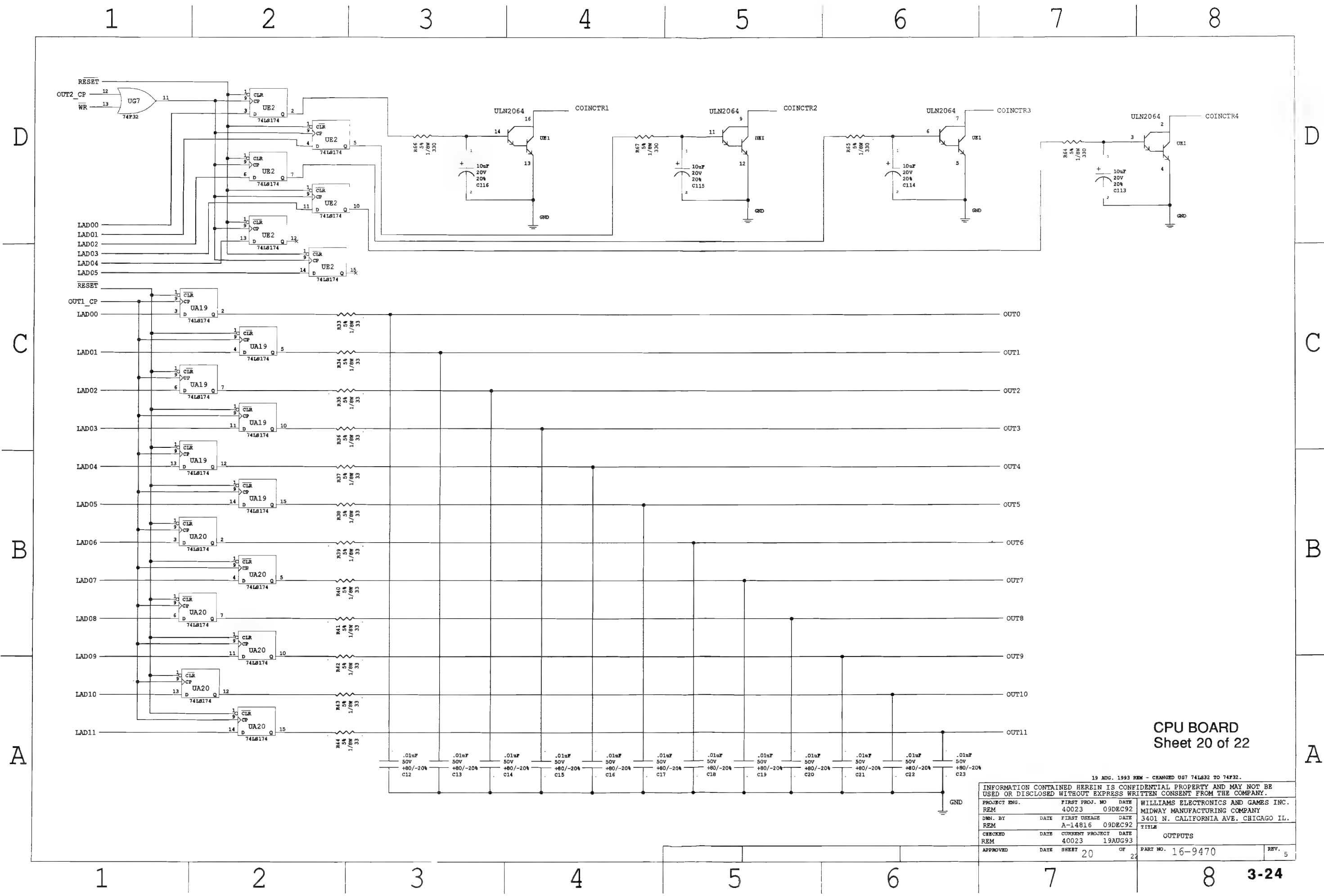
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CPU BOARD  
Sheet 19 of 22

19 AUG. 1993 REM - CHANGED 007 74LS32 TO 74F32.

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	FIRST PROJ. NO.	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DWN. BY	DATE	FIRST USAGE	DATE
REM	A-14816	09DEC92	3401 N. CALIFORNIA AVE. CHICAGO IL.
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APPROVED	DATE	SHEET	19
OF	PART NO.	16-9470	REV. 5



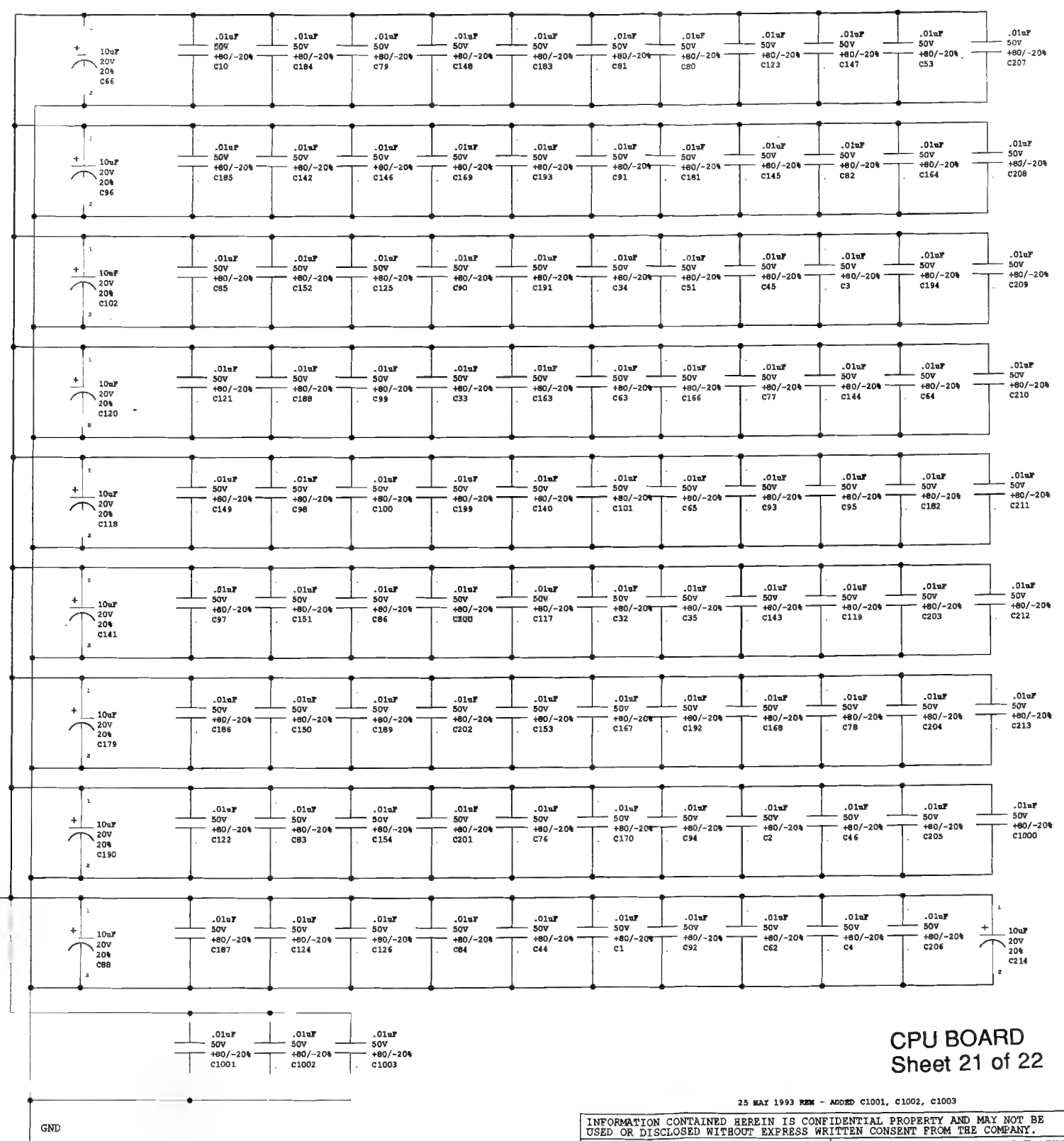
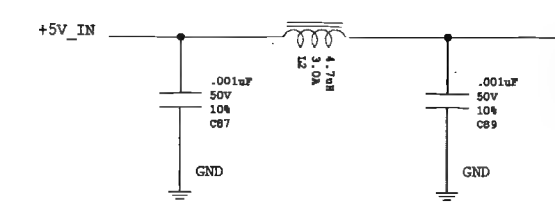
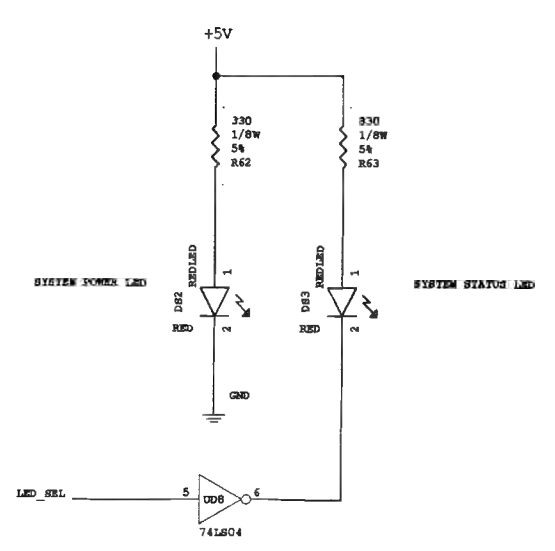
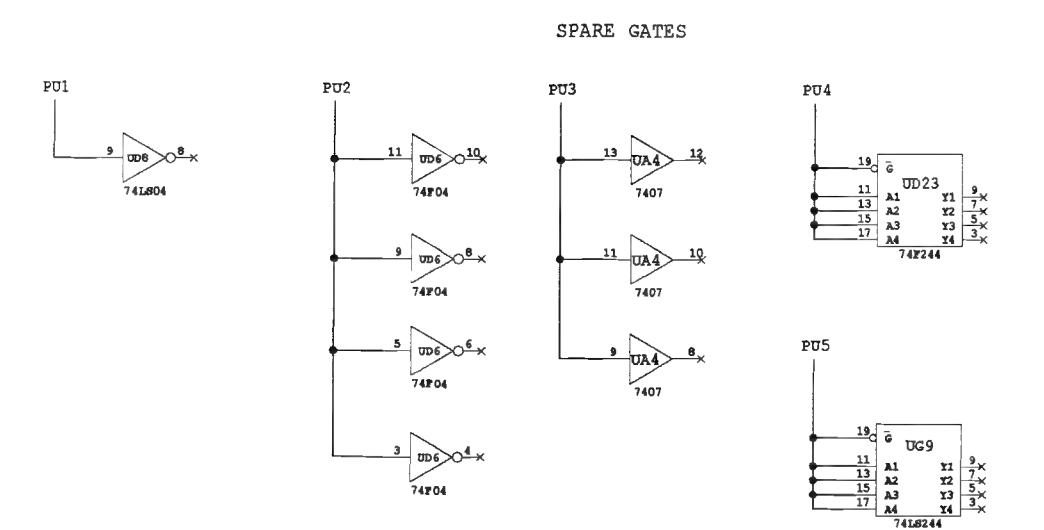
CPU BOARD  
Sheet 20 of 22

19 AUG. 1993 REM - CHANGED UG7 74LS32 TO 74F32.			
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DNW. BY	DATE	FIRST USAGE	DATE
REM	A-14816	09DEC92	3401 N. CALIFORNIA AVE. CHICAGO IL.
CHECKED	DATE	CURRENT PROJECT	DATE
REM	40023	19AUG93	00000
APPROVED	DATE	SHEET	OF
		20	22
PART NO. 16-9470			REV. 5

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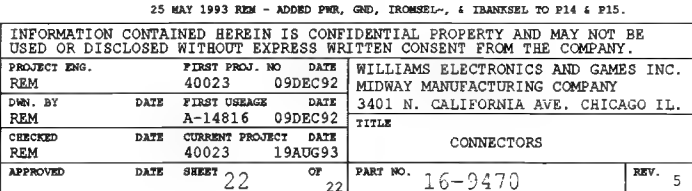
1 2 3 4 5 6 7 8

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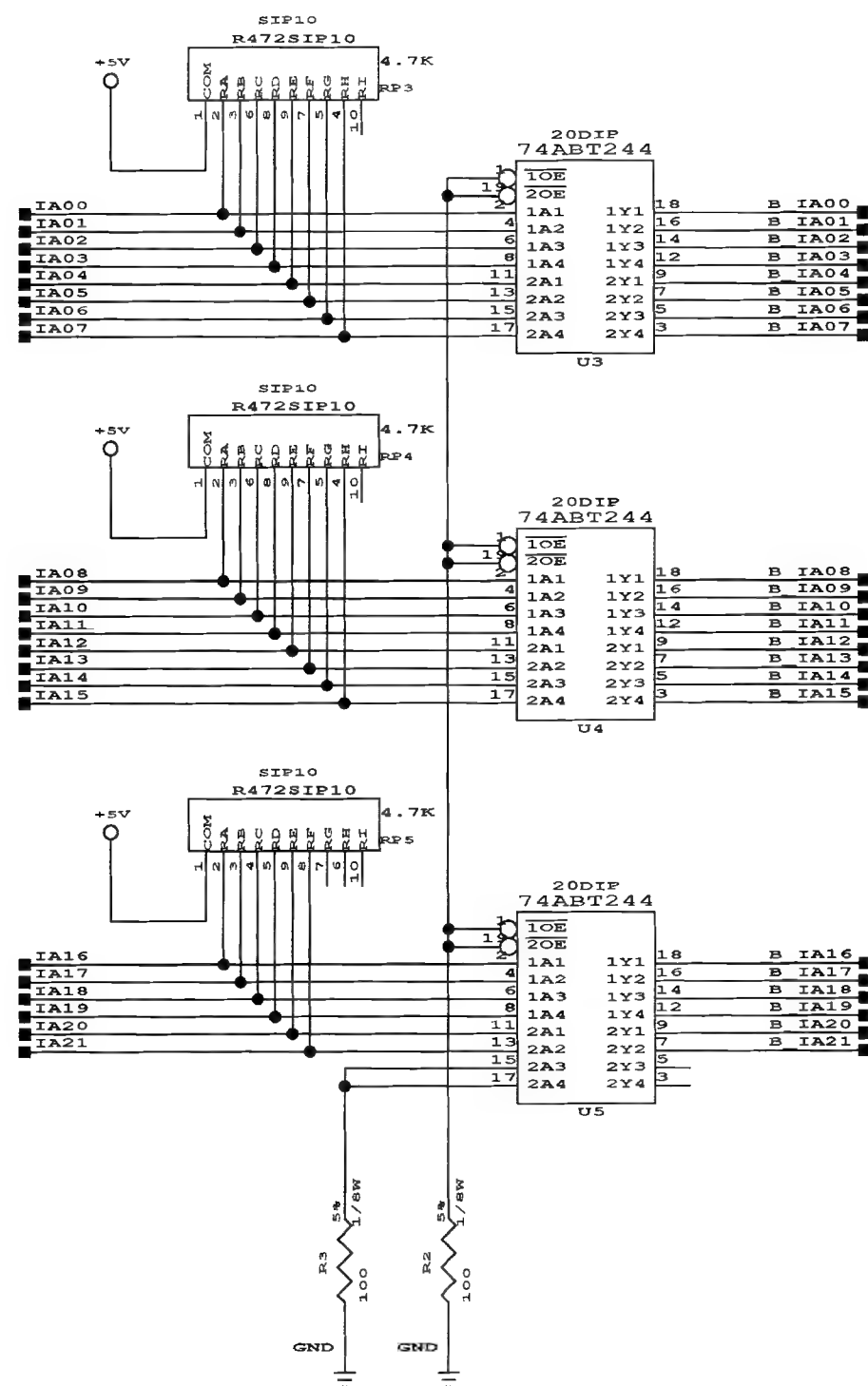


CPU BOARD  
Sheet 21 of 22

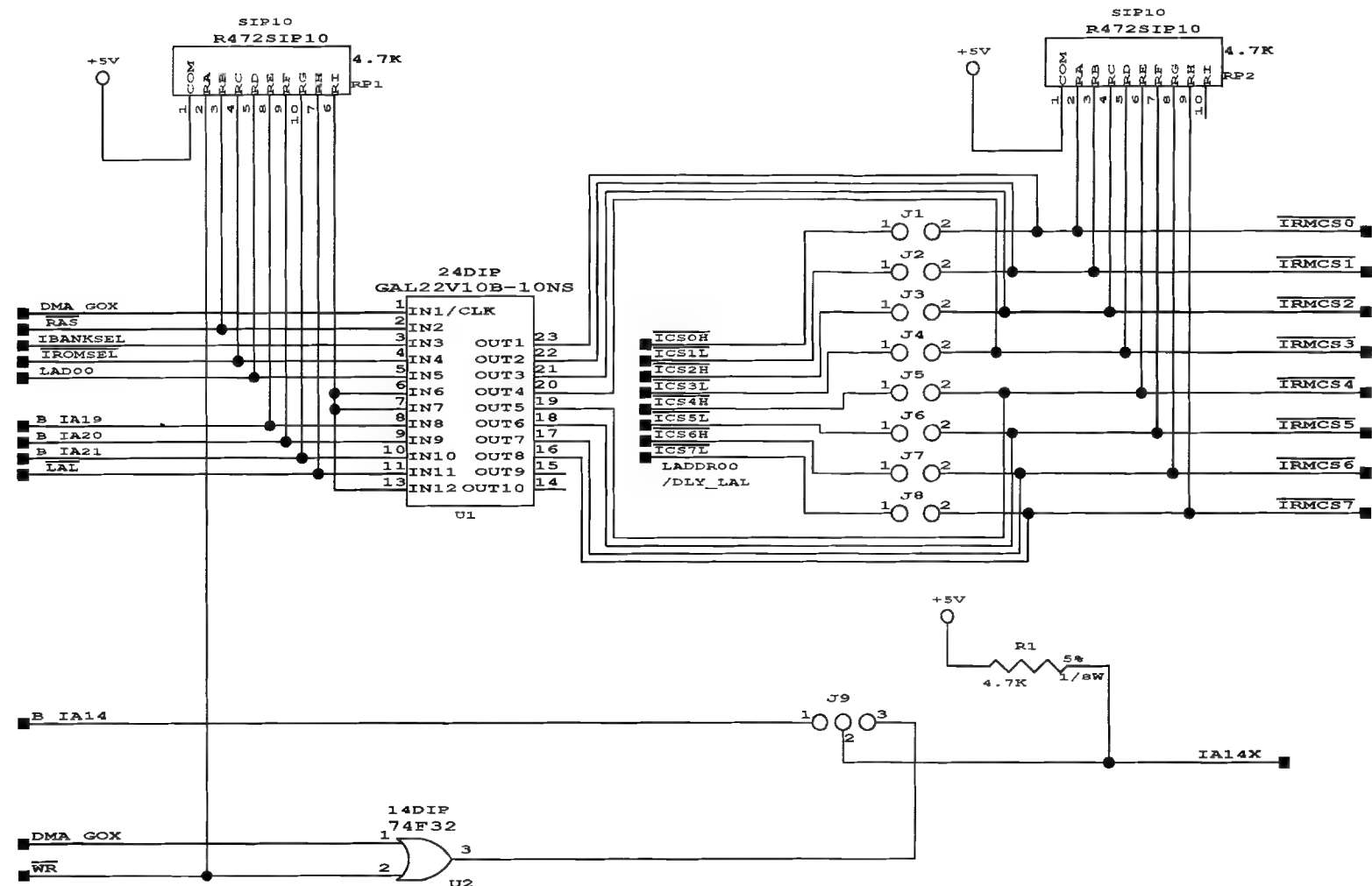
25 MAY 1993 REM - ADDED C1001, C1002, C1003			
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	FIRST PROJ. NO.	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM	40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DWN. BY	FIRST USAGE	DATE	3401 N. CALIFORNIA AVE. CHICAGO IL.
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CHECKED	DATE	CURRENT PROJECT	POWER
REM	40023	19AUG93	
APPROVED	DATE	SHEET	PART NO.
		21 OF 22	16-9470
			REV. 5



# IROM ADDRESS BUFFERS



# IROM CS GENERATOR

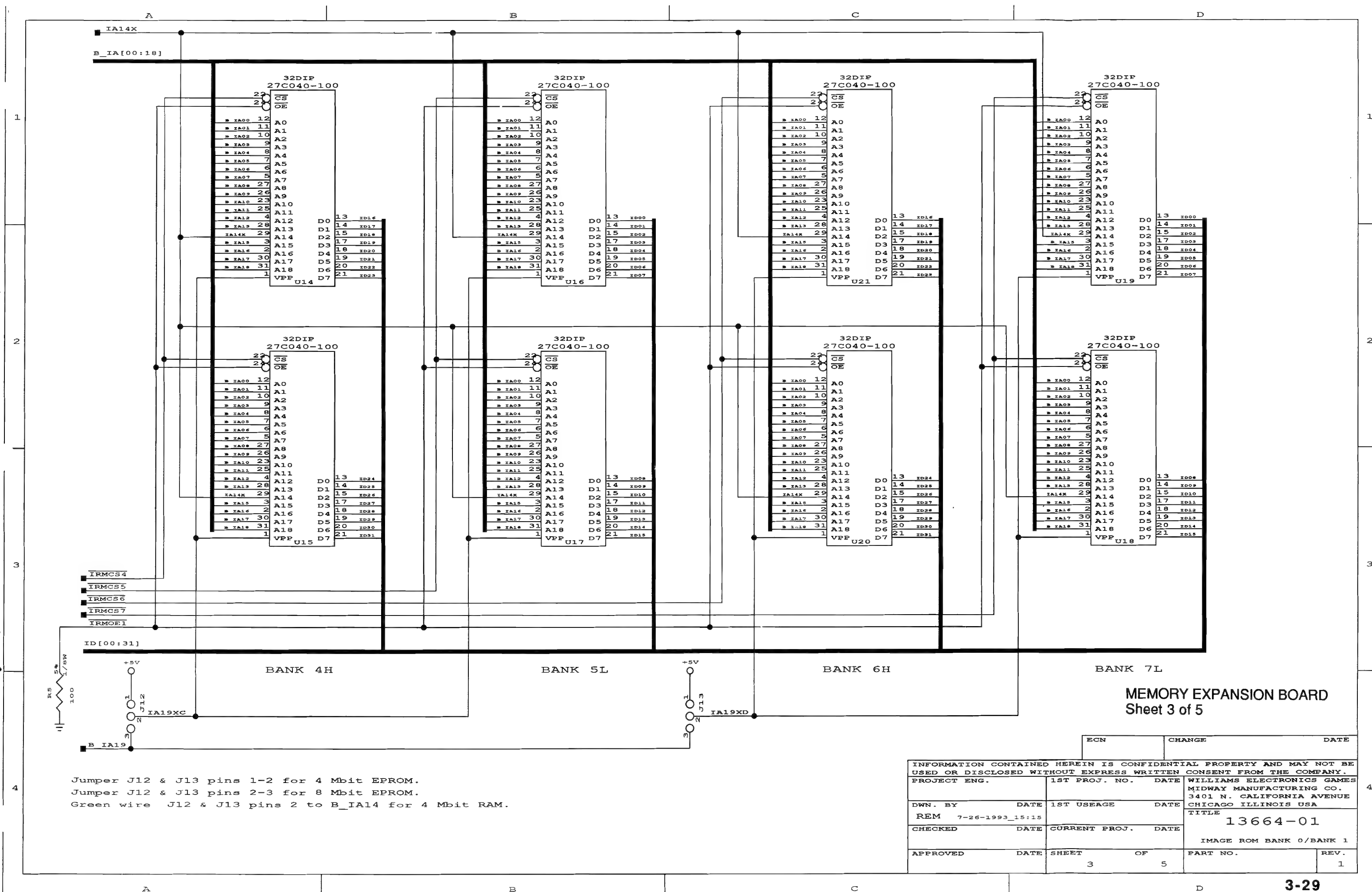


## MEMORY EXPANSION BOARD Sheet 1 of 5

ECN		CHANGE		DATE	
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.		1ST PROJ. NO.		DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY		DATE		1ST USEAGE	DATE
REM 8-20-1993_6:34				TITLE	
CHECKED		DATE		CURRENT PROJ.	DATE
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				PART NO.	REV.
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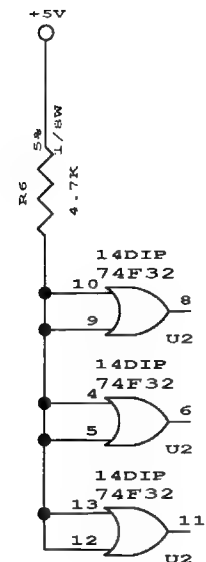


Jumper J12 & J13 pins 1-2 for 4 Mbit EPROM.  
Jumper J12 & J13 pins 2-3 for 8 Mbit EPROM.  
Green wire J12 & J13 pins 2 to B\_IA14 for 4 Mbit RAM.

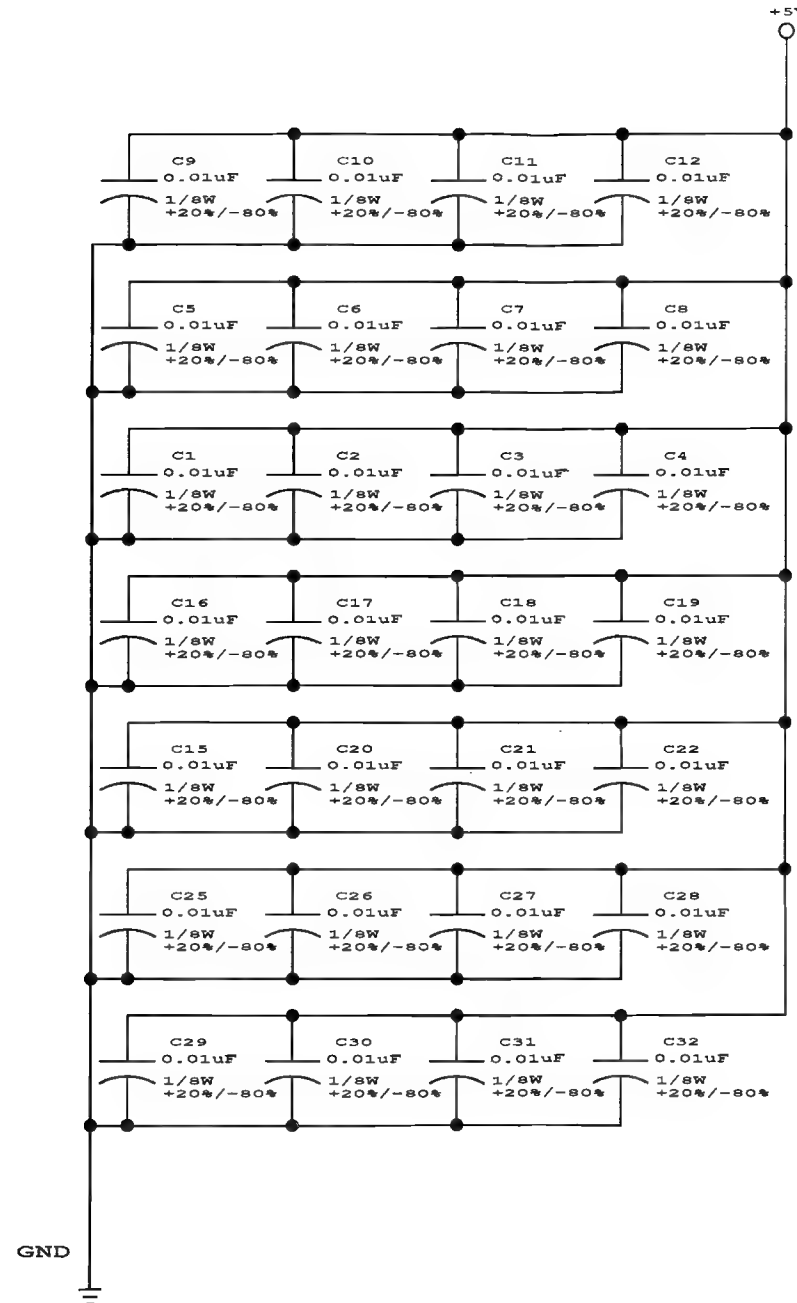
MEMORY EXPANSION BOARD  
Sheet 3 of 5

ECN		CHANGE		DATE
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.				
PROJECT ENG.	1ST PROJ. NO.	DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA	
DWN. BY	DATE	1ST USAGE	DATE	TITLE
REM	7-26-1993_15:15			13664-01
CHECKED	DATE	CURRENT PROJ.	DATE	IMAGE ROM BANK 0/BANK 1
APPROVED	DATE	SHEET	OF	PART NO.
		3	5	REV.
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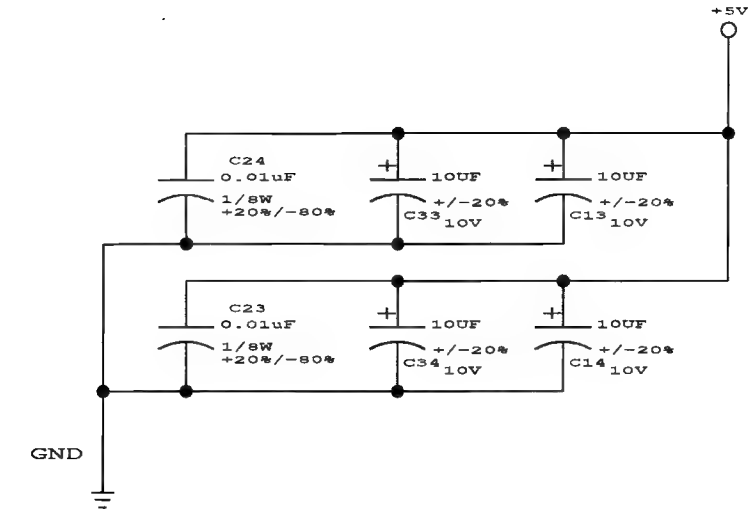
# SPARE GATES



# BYPASS CAPS



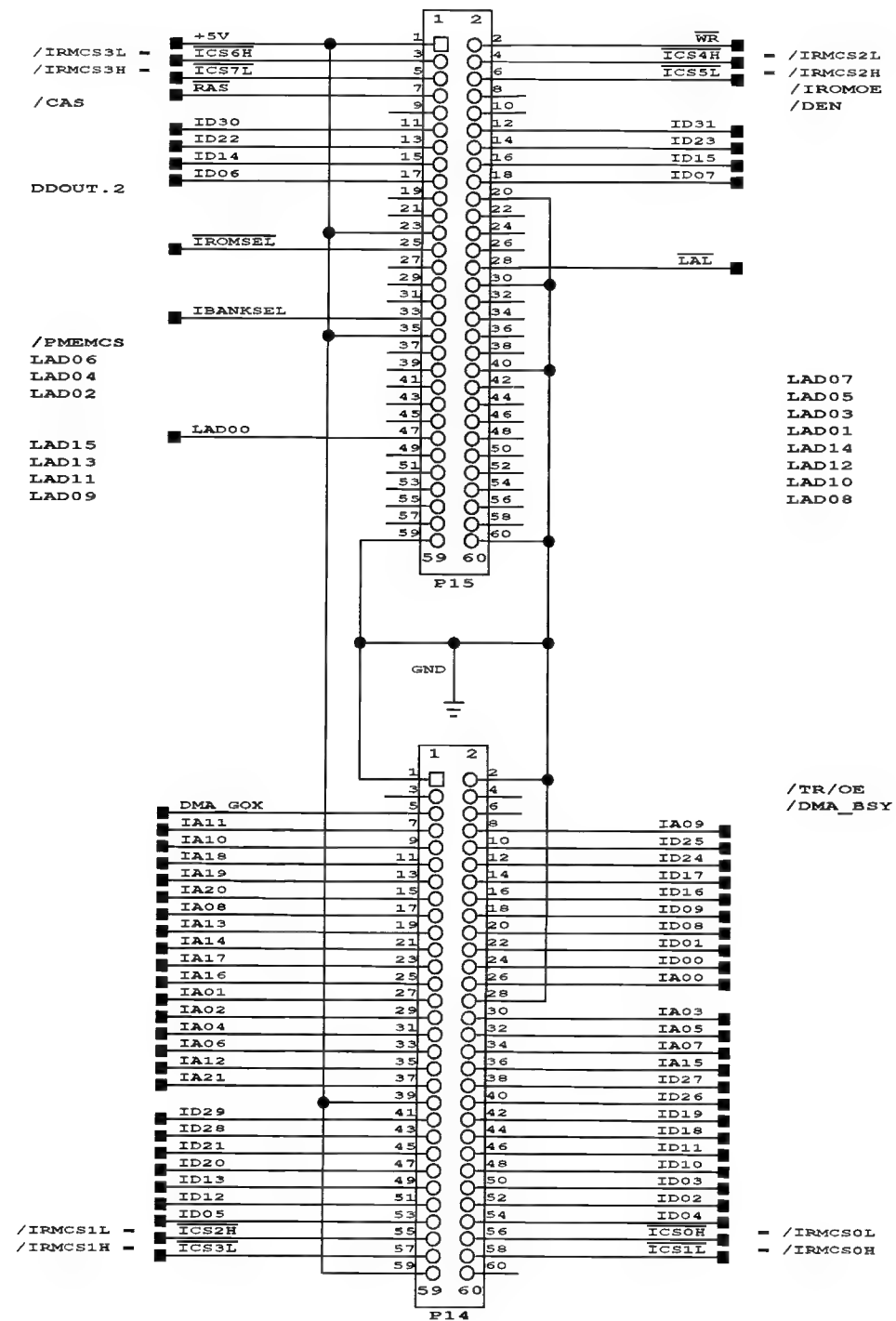
# FILTER CAPS



## MEMORY EXPANSION BOARD Sheet 4 of 5

		ECN	CHANGE	DATE
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.				
PROJECT ENG.	1ST PROJ. NO.		DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY	DATE	1ST USEAGE	DATE	TITLE 13664-01
REM 7-26-1993_15:15				CAPS/SPARE GATES
CHECKED	DATE	CURRENT PROJ.	DATE	
APPROVED	DATE	SHEET	OF	PART NO.
			5	REV. 1

T-UNIT EXPANSION CONNECTORS

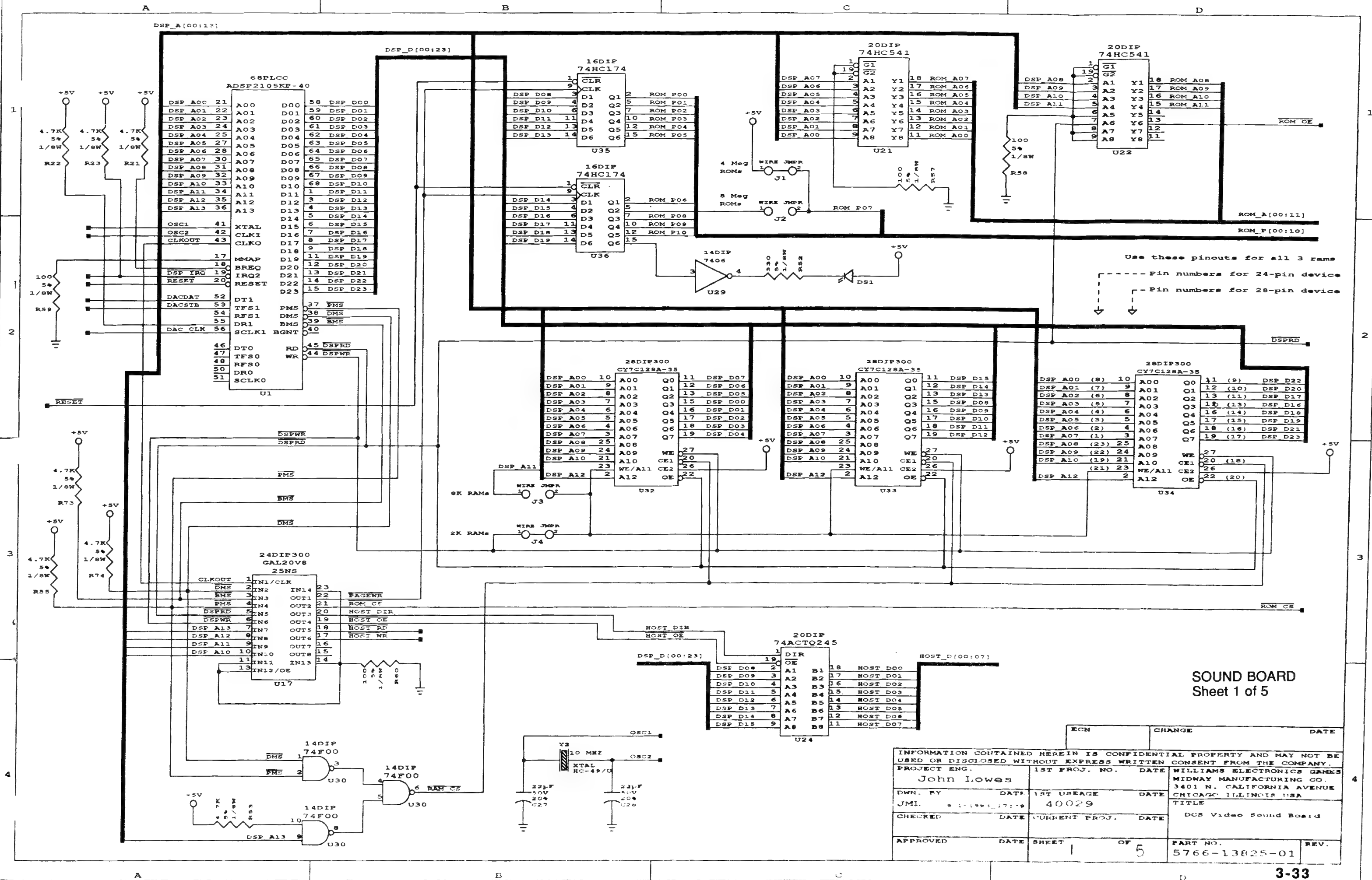


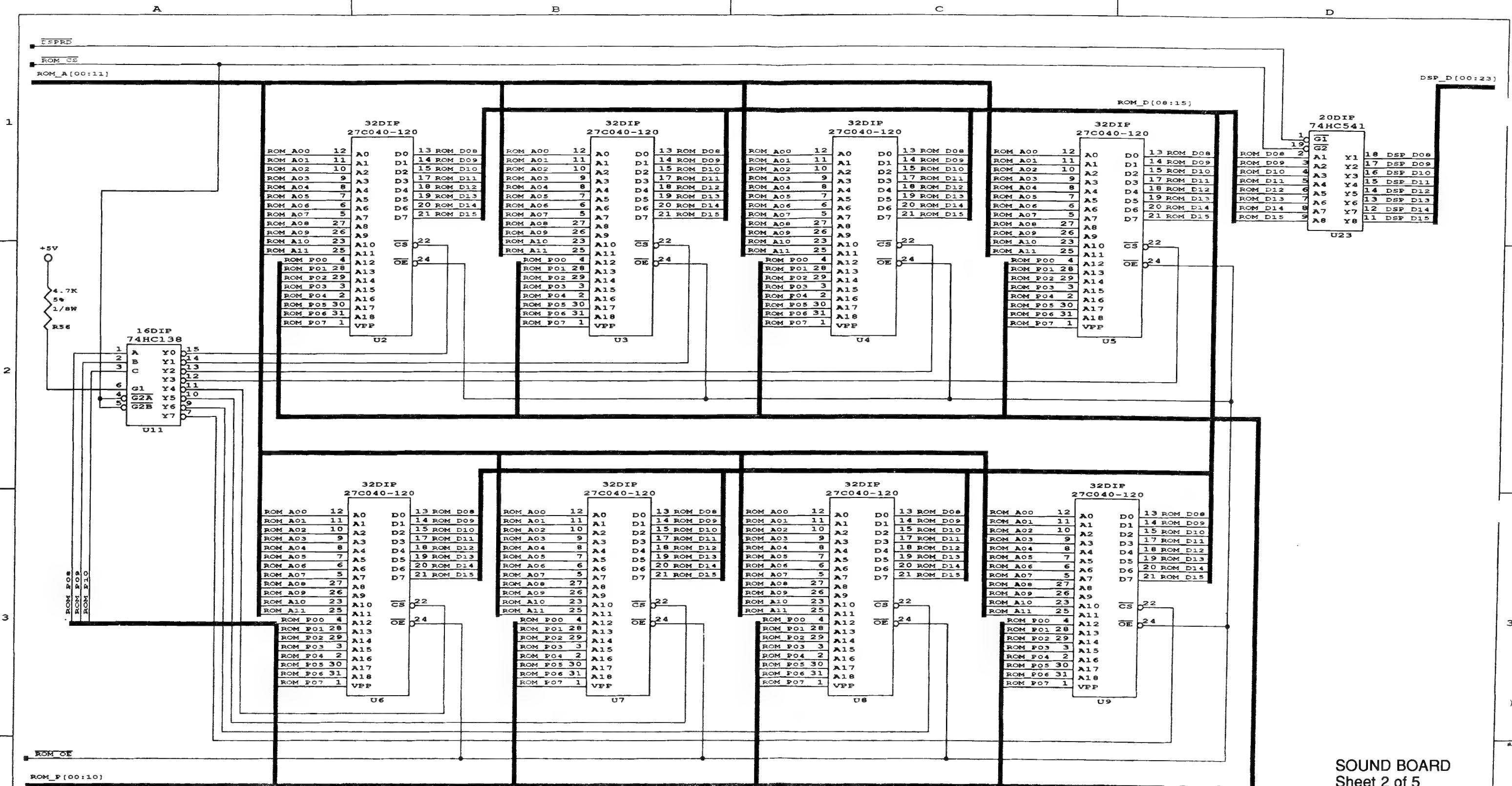
TUNIT CPU BOARD	EXPANSION CARD
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/IRMCS0H	= /ICS1L = /IRMSC1
/IRMCS1L	= /ICS2H = /IRMSC2
/IRMCS1H	= /ICS3L = /IRMSC3
/IRMCS2L	= /ICS4H = /IRMSC4
/IRMCS2H	= /ICS5L = /IRMSC5
/IRMCS3L	= /ICS6H = /IRMSC6
/IRMCS3H	= /ICS7L = /IRMSC7

MEMORY EXPANSION BOARD  
Sheet 5 of 5

		ECN	CHANGE		DATE
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.		1ST PROJ. NO.		DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA TITLE 13664-01 EXP. CONNECTORS
DWN. BY		1ST USAGE		DATE	
REM 7-26-1993_15:15					
CHECKED		CURRENT PROJ.		DATE	
APPROVED		SHEET		OF	PART NO.
		5		5	REV. 1

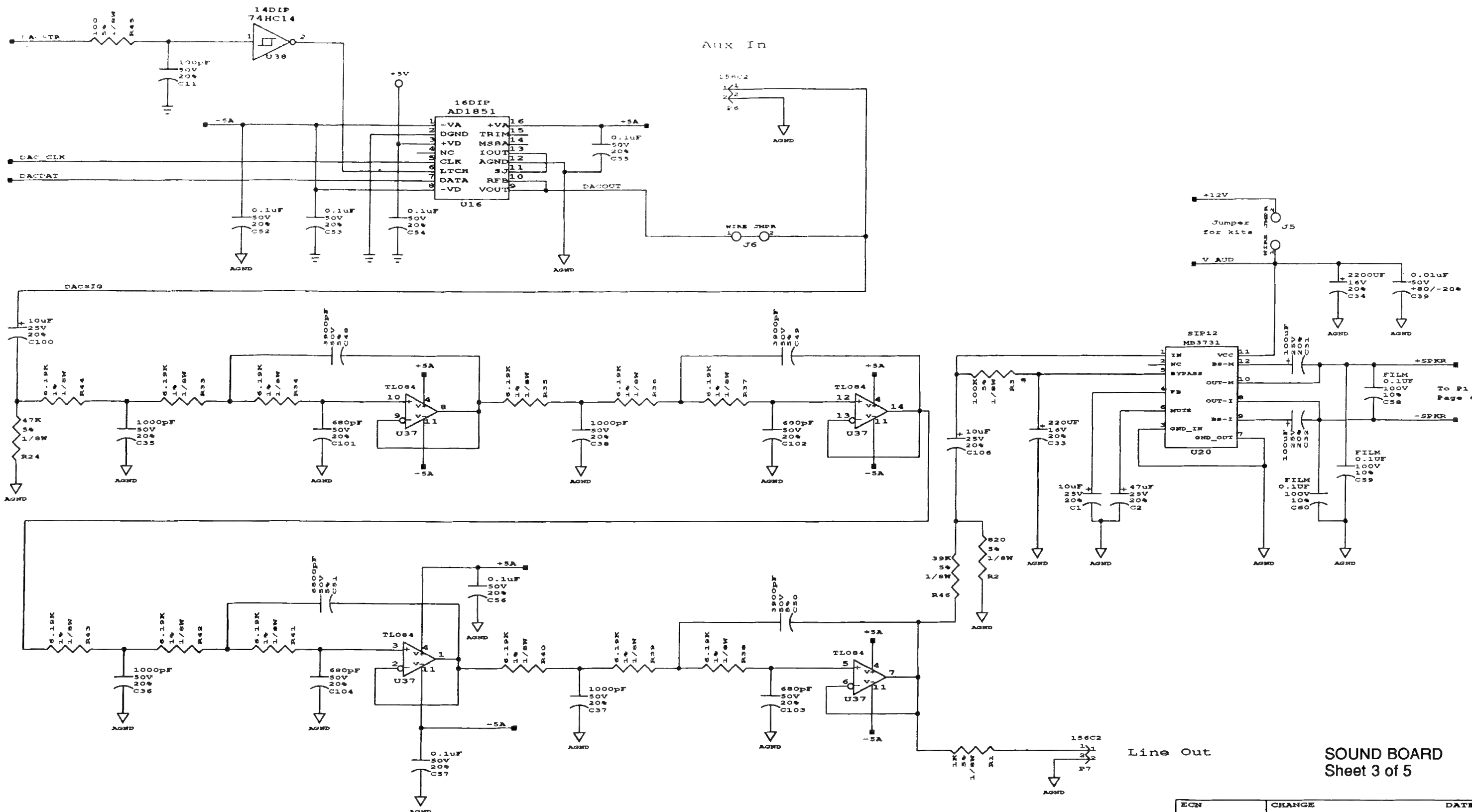






SOUND BOARD  
Sheet 2 of 5

ECN		CHANGE		DATE	
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.		1ST PROJ. NO.	DATE	WILLIAMS ELECTRONICS GAMES	
John Lowes				MIDWAY MANUFACTURING CO.	
OWN. BY		1ST USAGE	DATE	3401 N. CALIFORNIA AVENUE	
JML		9-1-1993	17:39	CHICAGO ILLINOIS USA	
CHECKED		CURRENT PROJ.	DATE	TITLE	
				DCS Video Sound Board	
APPROVED		SHEET	OF	PART NO.	REV.
		2	5	5766-13825-01	

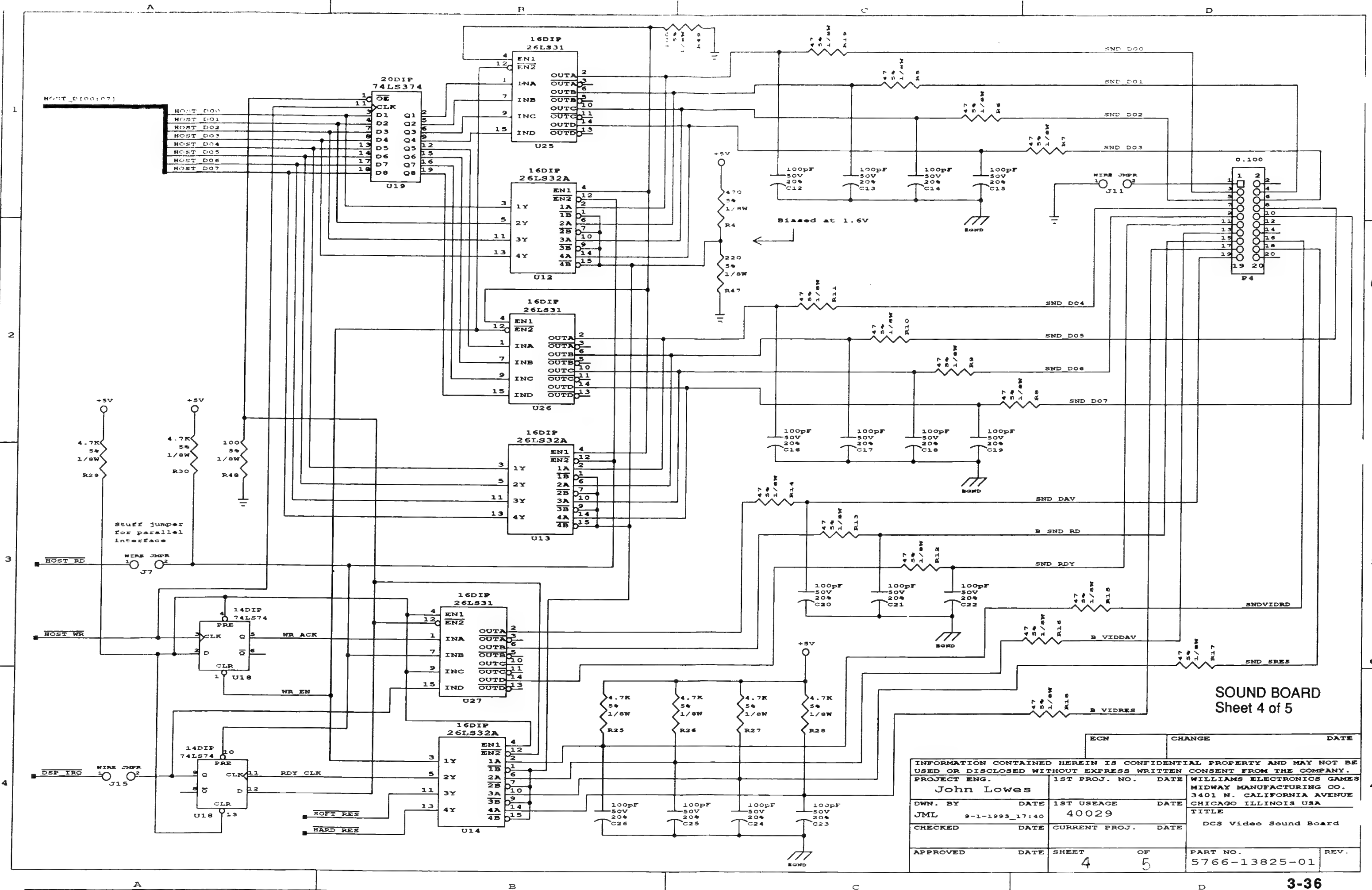


Line Out

**SOUND BOARD**  
Sheet 3 of 5

AGND

ECN		CHANGE		DATE	
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.		1ST PROJ. NO.		DATE	
John Lowes				WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA	
DWN. BY		1ST USAGE		DATE	
JML		40029		TITLE	
9-1-1993_17:39				DCS Video Sound Board	
CHECKED		CURRENT PROJ.		DATE	
				Anti-Aliasing Filter	
APPROVED		SHEET		OF	
		3		5	
				PART NO.	
				5766-13825-01	
				REV.	
				-	

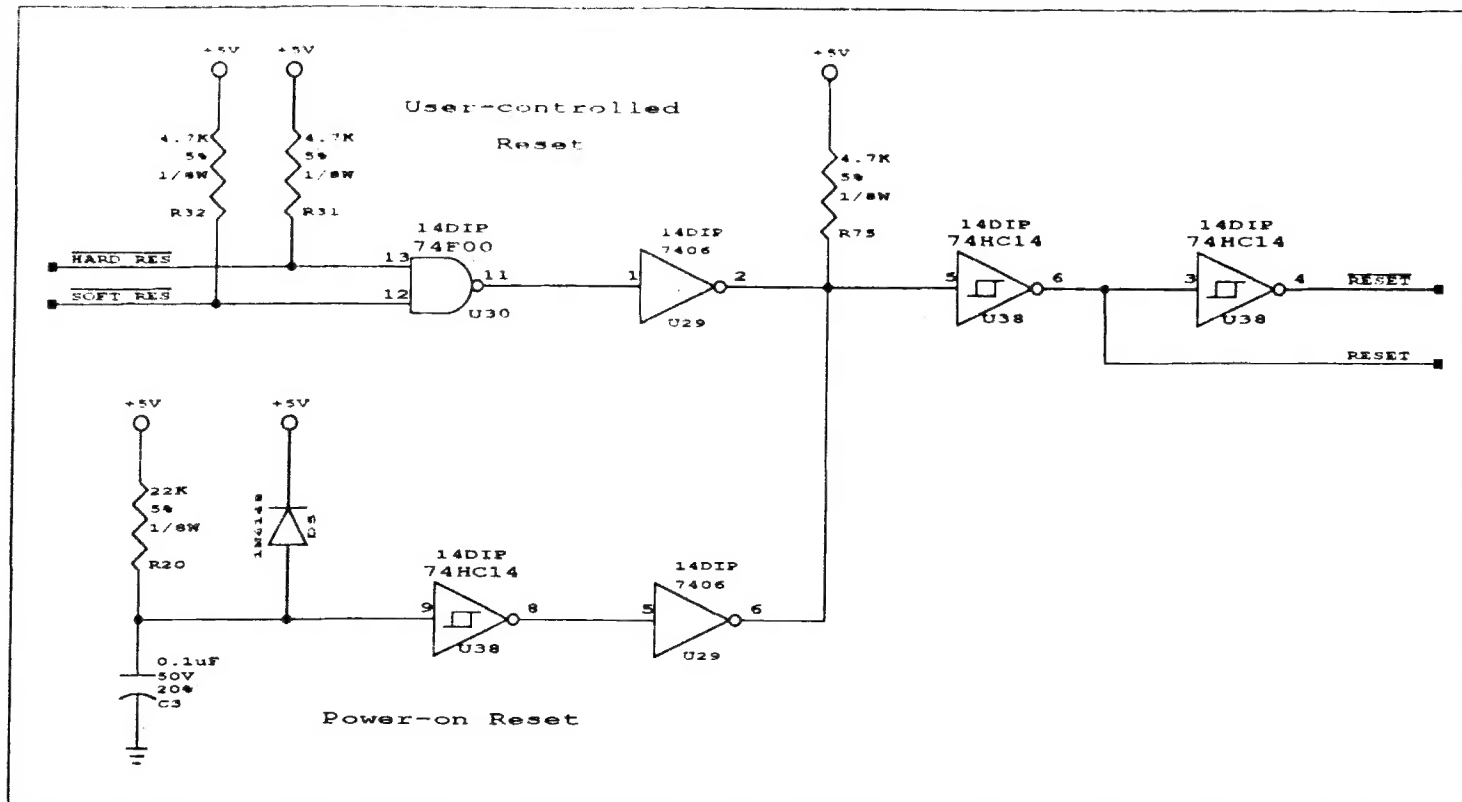


SOUND BOARD  
Sheet 4 of 5

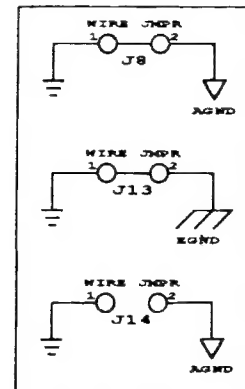
ECN		CHANGE		DATE	
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG.		1ST PROJ. NO.		DATE	
John Lowes				WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA	
DWN. BY		DATE		TITLE	
JML		9-1-1993_17:40		DCS Video Sound Board	
CHECKED		DATE			
APPROVED		DATE		PART NO.	
		SHEET 4 OF 5		5766-13825-01	
				REV.	



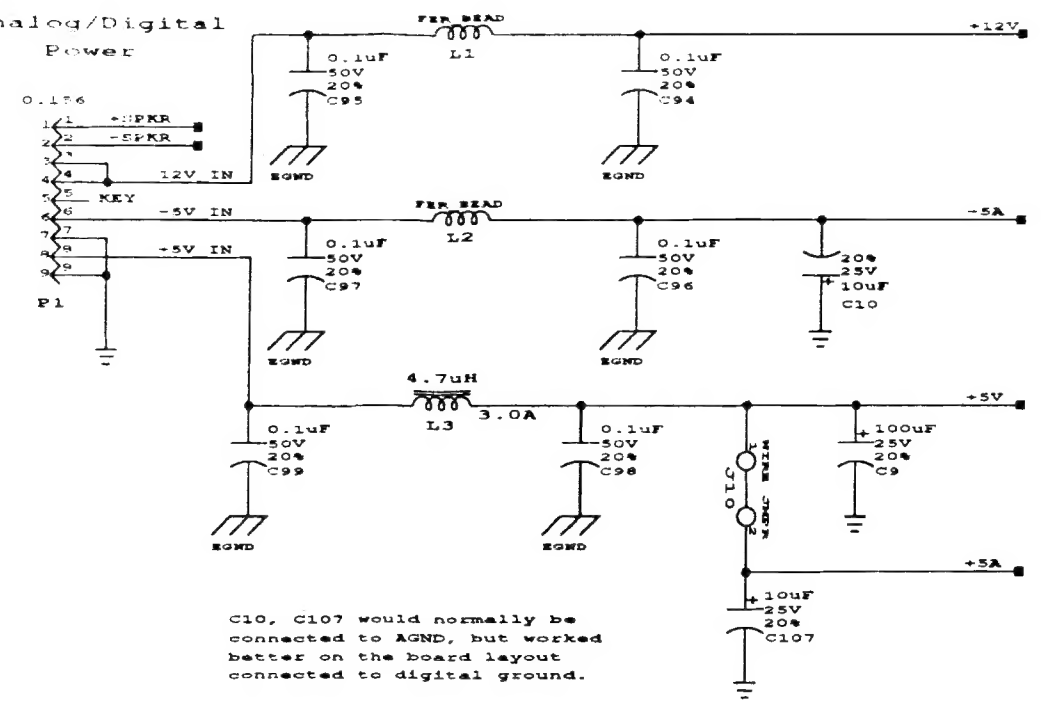
# Reset Circuit



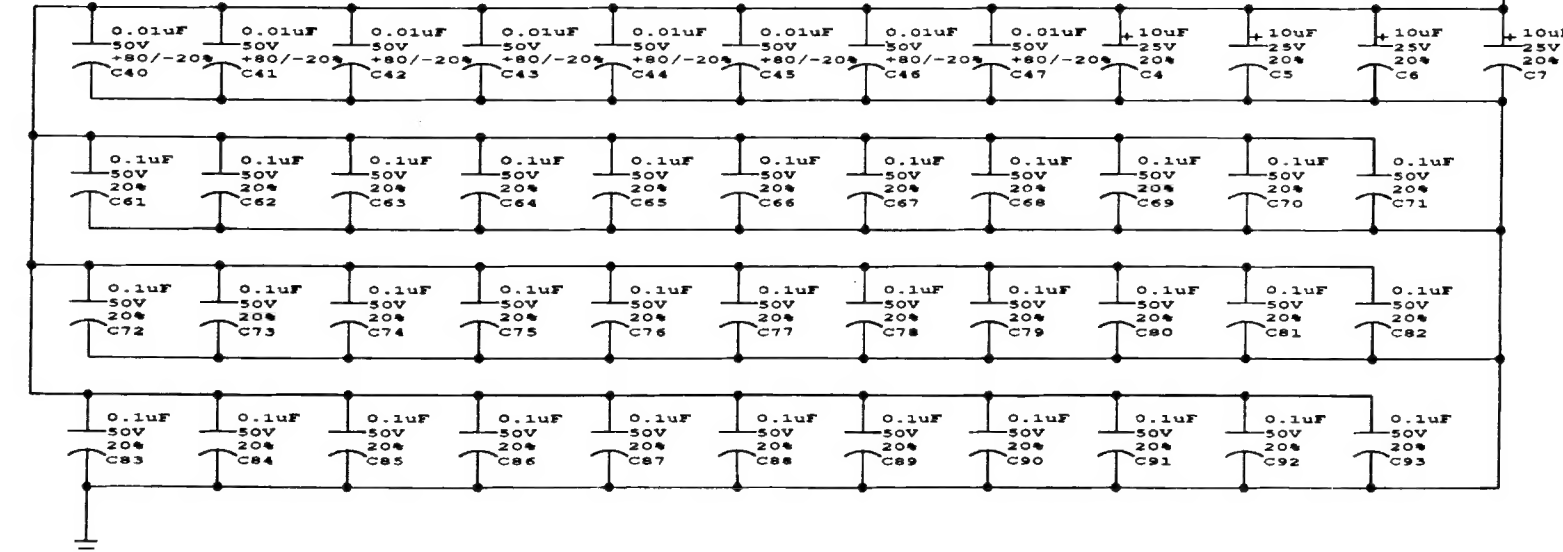
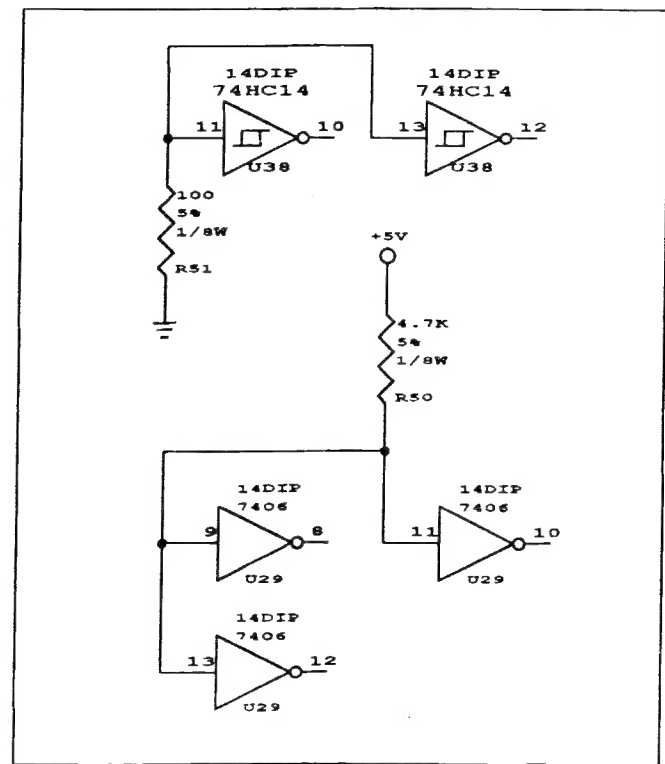
## GROUND ISOLATION



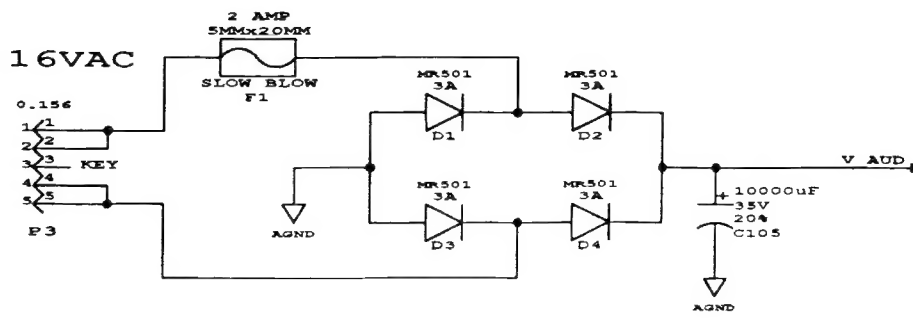
## Analog/Digital Power



## Spare Gates

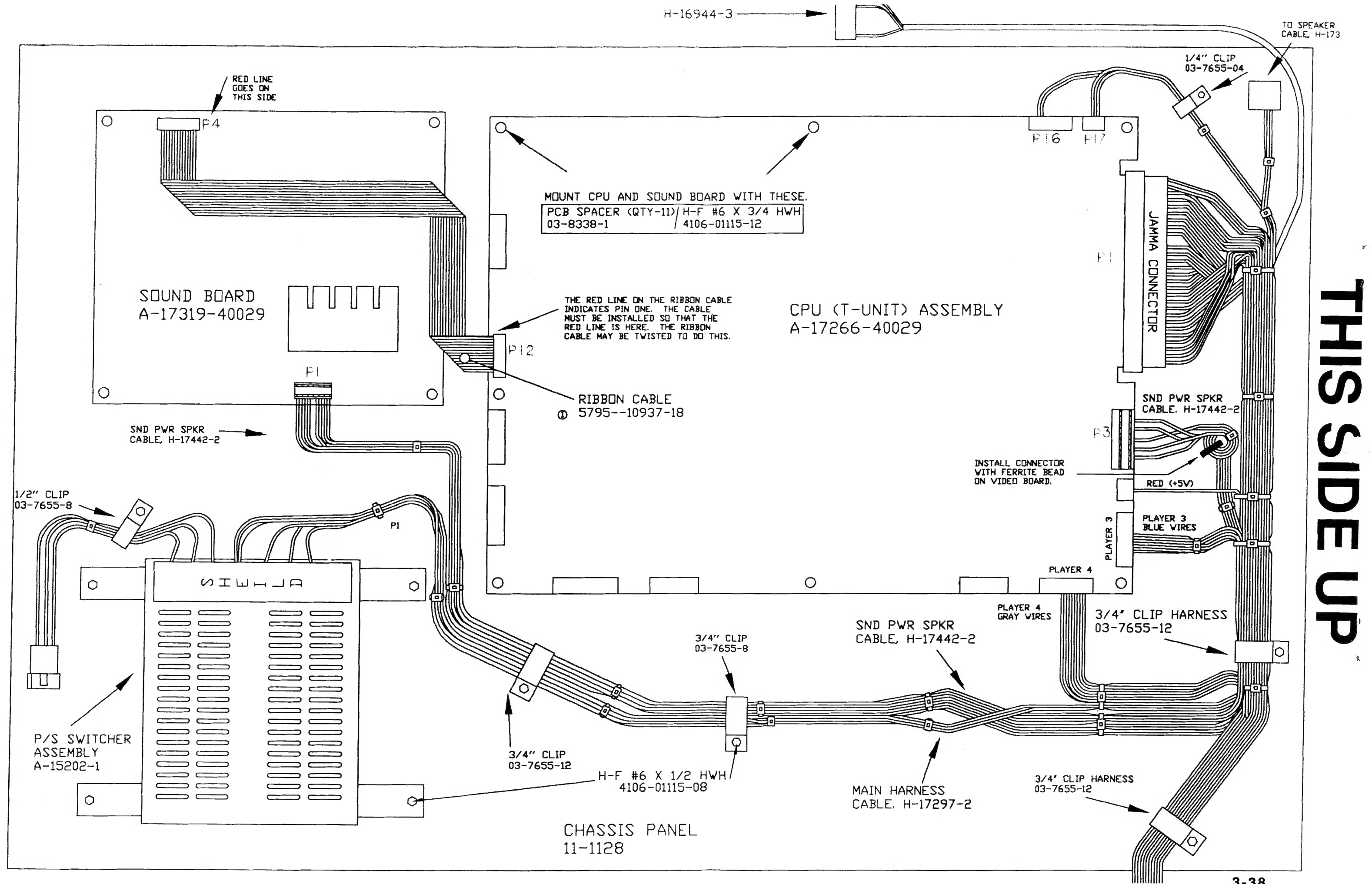


## 16VAC



## SOUND BOARD Sheet 5 of 5

ECN	CHANGE	DATE
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG.	1ST PROJ. NO.	DATE
John Lowes	40029	
DWN. BY	DATE	1ST USAGE
JML	9-1-1993_17:41	40029
CHECKED	DATE	CURRENT PROJ.
APPROVED	DATE	SHEET
		5
		OF
		5
PART NO.	REV.	
5766-13825-01		



## Control Panel Wire Colors

### Player One

Start	White
Up (Jump)	White-Black
Down (Duck)	White-Brown
Left (Move)	White-Red
Right (Move)	White-Orange
High Punch	White-Yellow
Block	White-Green
High Kick	White-Blue
Low Punch	Blue-Black
Low Kick	Blue-Brown
Ground	Black

### Player Two

Start	Violet-White
Up (Jump)	Violet-Black
Down (Duck)	Violet-Brown
Left (Move)	Violet-Red
Right (Move)	Violet-Orange
High Punch	Violet-Yellow
Block	Violet-Green
High Kick	Violet-Blue
Low Punch	Blue-Black
Low Kick	Blue-Brown
Ground	Black

## PC Board Jumpers

### CPU Board

J18, J19, J22, J24	0 $\Omega$ Resistor, 1/4W
J28, J154	

### Sound Board

J5, J8, J10, J13	Wire Insulated Jumper
J1, J4, J6, J7, J15	0 $\Omega$ Resistor, 1/4W

## **WARNINGS & NOTICES**

### **Warning**

**USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.**

\* For safety and reliability, substitute parts and modifications are not recommended.

\* Substitute parts or modifications may void FCC type acceptance.

\* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under Federal law. This also applies to MIDWAY logos, designs, publications and assemblies. Moreover, facsimiles of MIDWAY equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with MIDWAY components.

### **Warning**

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### **Warning**

Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

### **Notice**

**When MIDWAY ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC sticker, call MIDWAY immediately.**

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### **FOR SERVICE:**

**CALL YOUR AUTHORIZED MIDWAY DISTRIBUTOR.**

**MIDWAY Manufacturing Company  
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CHICAGO, IL 60618**